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At the Sign of the Compass and Quadrant
The Life and Times of Anthony Lamb

SILVIO A. BEDINI

Keeper of the Rare Books, Smithsonian Institution

THE AMERICAN PHILOSOPHICAL SOCIETY

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Dedication

To The Memory of
Derek J. de Solla Price

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PREFACE

A significant although little known figure in the history of early American science is Anthony Lamb, a maker of mathematical instruments who was active on the waterfront of New York for more than half a century, from 1730 to 1784. He had been trained in a skill which was rare in his time even in England, and it was one which was virtually unknown in the American colonies in the early eighteenth century.

English-born and transported to Maryland as a convicted felon for his criminal association with Jack Sheppard, the notorious London burglar who was hanged at Tyburn, Lamb emerged as the first professionally trained maker of scientific instruments in the American colonies, and the first to be established in New York.

I. THE APPRENTICE AND THE SORCERER

The Apprentice

Anthony Lamb was born in London in 1703. In accordance with general practice, when he reached the age of fourteen he was placed in apprenticeship to be trained in a trade. He was apprenticed to Henry Carter, a maker of mathematical instruments who was believed to be his uncle, and became part of his household. In the eighteenth century the usual period of training was seven years, although earlier it had ranged from eight to ten years. It was customary for the parents of the apprentice to pay the costs of food and clothing which were to be provided by his master during this period.

Carter maintained his shop on Wych Street near the church of St. Clement Danes in the Strand. There in an earlier period several important English makers of scientific instruments had plied their trade. Among them were Charles Whitwell, Elias Allen, and Nathaniel Noble, and it is conceivable that Carter may have served his own apprenticeship with one of them. Carter's name does not appear among the instrument makers pertaining to any of the London Companies, and all that is known about him relates to his employment of Lamb.

The church of St. Clement Danes, which was the dominant feature of the locality in which he worked, was relatively new. It had been designed by Christopher Wren and erected in 1681 on the site of an earlier church which derived its name from an early Danish settlement in the area before the Norman Conquest.

As well as can be determined, Lamb was a personable and conscientious young man of good habits during the years that he spent with Carter. He learned to work in wood, ivory, brass and silver, and became a skilled engraver. He gave every evidence of a promising future career as he neared the end of his apprenticeship.[1]

The Sorcerer

It was in the final year of his apprenticeship that Lamb met and was befriended by another young man named John Sheppard. The latter was

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[1] E. G. R. Taylor, *The Mathematical Practitioners of Hanoverian England 1714–1840* (Cambridge: At the University Press, 1966), 154, 162; Carl Bridenbaugh, *The Colonial Craftsman* (New York: New York University Press, 1950), 160–61; Silvio A. Bedini, *Early American Scientific Instruments and Their Makers.* U.S. National Museum Bulletin No. 231 (Washington, D.C.: Smithsonian Institution, 1964), 28–29; Silvio A. Bedini, *Thinkers and Tinkers. Early American Men of Science* (New York: Charles Scribner's Sons, 1975), 122–23.

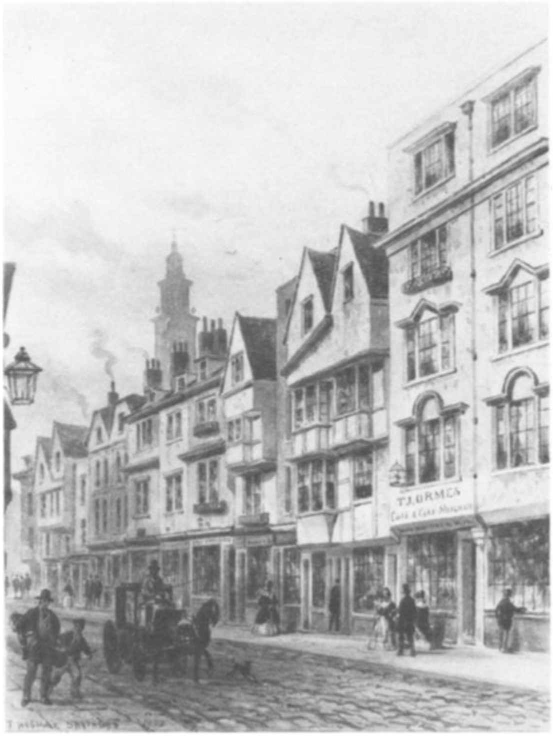

FIG. 1a. "Old Houses in Wych Street." Engraving by T. H. Shepherd, 1851. Courtesy the British Museum.

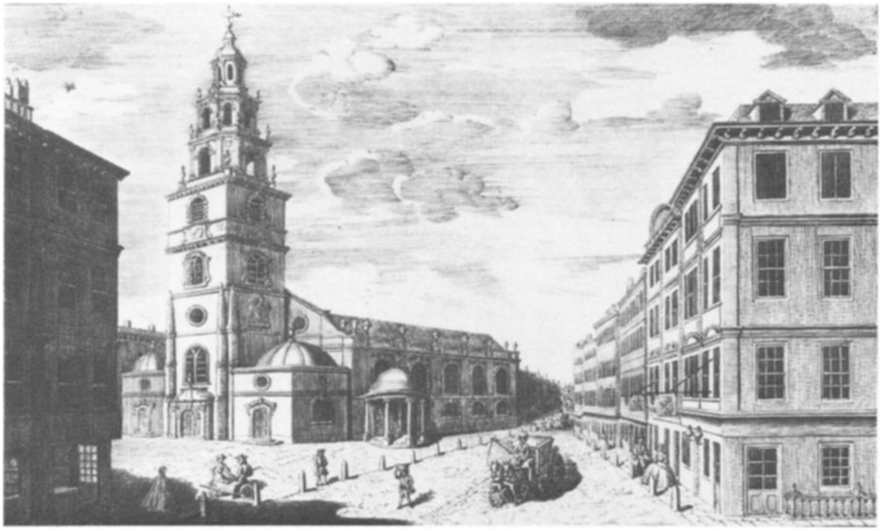

FIG. 1b. A Perspective View of St. Clement's Church Looking Towards Temple Bar. Engraving by J. Maurer, 1753. Courtesy The British Museum.

one year older, described as pale of feature with dark, lively eyes, a small head, and a short lean body that belied his actual age. He was born in 1702 at Stepney near London and was a typical Cockney. His father having died when he was a small child, Sheppard was raised in Bishopsgate workhouse until he had completed two years of schooling at Bishopsgate-street school. When he was old enough to be apprenticed, he was assigned to Owen Wood, a carpenter employed by W. Kneebone, a well-to-do draper and merchant. He acquitted himself well and developed into a skillful carpenter.

It was not until Sheppard became acquainted with Joseph Hind, a button mould-maker, that he fell upon evil ways. Hind was the keeper of the Black Lion Inn, an alehouse on Drury Lane, in the vicinity of St. Clement Danes. It was a particularly unsavory section of London in this period, where "there are frequent outcries in the night, fighting, robberies, and all sorts of debaucheries committed by them all night long to the great inquietude of his majesties subjects."[2]

Hind taught Sheppard to drink and introduced him to Elizabeth Lyon, a prostitute and thief who subsequently achieved unenviable notoriety as "Edgeworth Bess." She had become a fixture at the Black Lion, and it was not long before Sheppard fell totally under her spell. In short order she taught him the art of stealing, first by pilfering and then by more flagrant means.

Soon Sheppard developed another close associate at the Black Lion, a woman called Maggot who was also occasionally his mistress. She persuaded him to rob the house of a piece-broker named Bain, where he successfully escaped with money, a piece of fustian, and other goods. He did not return to his master's home that night, and Wood's suspicions were aroused. Searching Sheppard's trunk some time later, he found the fustian and informed Bain. Sheppard was promptly arrested for the theft, but managed to talk his way out of it. Wood retained him in his employ with some reservation, but it was soon after, in the last year of his apprenticeship, that Sheppard quarreled with his master and absconded. Thereafter Sheppard worked as a journeyman carpenter, often robbing the houses where he worked. He lived at Parson's Green until he was arrested as a runaway apprentice and jailed.

Throughout his lawbreaking career, the Black Lion remained Sheppard's center of activities, and it was to this alehouse that he always gravitated sooner or later. It was consequently at the Black Lion that he first made the acquaintance of Anthony Lamb, the shy young apprentice from Carter's nearby shop. Sheppard had already achieved city-wide fame as a burglar and escape artist, a reputation of which he was inordinately proud. He had become so eminent in his own way by this time that it was said that every prig in St. Giles considered it an honor to be seen in his company.[3]

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[2] Horace Bleakley, *Jack Sheppard. With an Epilogue by S. M. Ellis* (Edinburgh: William Hodge & Company, Ltd., 1933), 9; Andrew Knapp and William Baldwin, *The Newgate Calendar; Comprising Interesting Memoirs of the Most Notorious Characters Who Have Been Convicted of Outrages on the Laws of England. . . .* (London: J. Robins & Co., 1924), 1: 209–18.

One evening while Sheppard and Edgeworth Bess were disporting themselves as usual at the alehouse, he recognized young Lamb from the time that he too had worked on Wych Street, and he spoke to the young apprentice. Lamb, who had ventured in for a drink, was well informed of Sheppard's exploits, and was greatly flattered by the recognition. They soon were friends, and Lamb became one of the small group that clustered around Sheppard and Bess nightly as they drank and recounted their exploits of the day.

Lamb was intrigued with the outlaws' lives of abandoned freedom and constant gambling with danger, so different from his own boring routine.

The Crime

It was while Sheppard and his companions in crime were contemplating new targets for burglary that Lamb, in a rash moment and undoubtedly at Sheppard's goading, sought to impress him by suggesting a particularly remunerative potential victim of his own acquaintance.

He told Sheppard about a master tailor named William Barton who rented lodgings from Lamb's master, Henry Carter. To all appearances, Barton was a wealthy man with important clients. Sheppard questioned Lamb closely to determine the nature and extent of the tailor's possessions, and immediately became interested in the prospect of what appeared to be an easy theft. Extremely naive and overwhelmed by Sheppard's attention, Lamb was eager to cooperate in every way. Encouraged by Sheppard, he agreed to leave Carter's street door open on any night that Sheppard chose for his visit.

The night Sheppard selected was that of 16 June, and he so informed Lamb in advance. It proved to be a particularly convenient night for the burglar's plans, for Barton had attended a party during the evening and had been drinking heavily. As a consequence, he retired immediately upon his return, and was soon soundly sleeping. Lamb waited until the rest of the household had retired, then unlocked the outer door, and made his way to his own little room on the premises. If he became aware of Sheppard's arrival, he made no effort to join him. Eventually he fell asleep, and it was not until the next day that he learned what had transpired.

According to plan, Sheppard and his accomplice, Charles Grace, arrived at Carter's residence at two o'clock in the morning. Ensuring that everyone slept, they crept up to Barton's room, where they found the tailor snoring heavily. Grace kept a pistol aimed at Barton's head in the event he should suddenly awaken, while Sheppard ransacked the rooms. He took the tailor's best suits, a considerable sum of money to the amount of almost three hundred pounds, and other articles of value. The thieves made their escape

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[3] Knapp and Baldwin, *The Newgate Calendar,* 225–55.

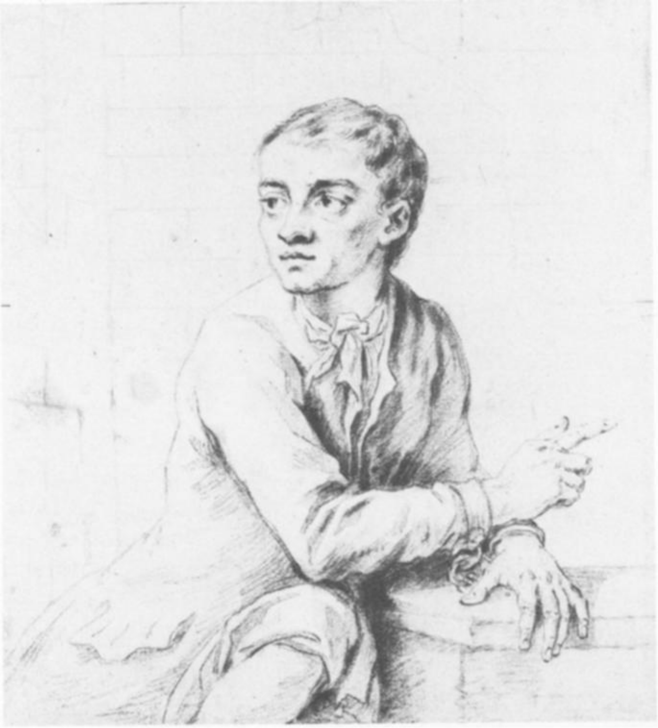

FIG. 2. Pencil sketch of John Sheppard while awaiting execution, made by James Thornhill in November 1724. Courtesy the National Portrait Gallery, London.

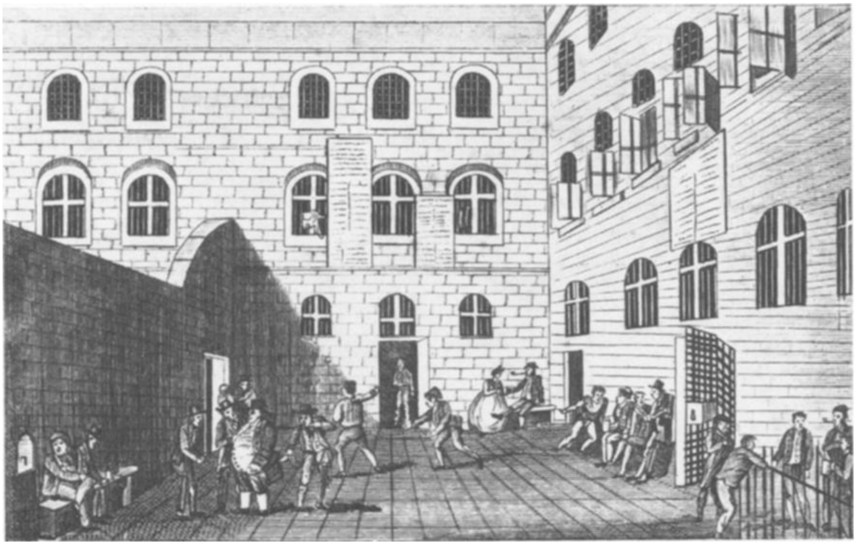

FIG. 3. Inner Court of Newgate Prison. Engraving, 1809, artist not known. Courtesy the British Museum.

easily and without incident while the household remained undisturbed. In their flight, however, they neglected to close the outer door.

At about four o'clock in the morning, Mrs. Carter arose and noting the telltale evidence of the open door, made her way to Barton's rooms where she found the premises in complete disarray and the tailor still in a drunken stupor. It was immediately evident that he had been robbed. She finally succeeded in awakening him, and then summoned her husband.

It was not long before the finger of suspicion pointed to Lamb, for his association with dissolute companions at the Black Lion had already come to the attention of Carter and become a subject of great concern to him. A constable was summoned and they made their way to Lamb's room. He was rudely awakened and dragged from his bed by his hair. After being accused and threatened, he confessed the small part he had had in the crime. He admitted that Sheppard and Grace had broken into and entered Barton's rooms, and that he had left the street door unlocked for them.

Despite more brutal handling and dire threats, however, he insisted that he did not know where they could be found. The stolen goods were advertised, but by the time this could be done, Sheppard had already sold them to a fence at an alehouse in Lewkenore Lane, keeping the money for himself.

Failing to find either the thieves or the stolen goods, the arm of the law reached out once more to the frightened young apprentice for further questioning. Lamb was taken before Justice Newton, and after being "strongly handled" and threatened, he confessed more than was necessary. Having identified his former companion as the burglar, he now revealed that Sheppard had mentioned that the next burglary he had planned to commit was at the home of William Kneebone, his former master and benefactor.[4]

Lamb was indicted for "breaking the House of *Henry Carter* in the Night Time, and stealing divers wearing Apparel, the Property of *William Barton,* and divers Persons, the 16th of June last," and ordered to await trial in prison.

Newgate and The Old Bailey

Lamb was taken to the notorious Newgate Prison, which for centuries had served as the county gaol for debtors and malefactors as well as the city prison for criminals.

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[4] John Villette, *The Annals of Newgate; or, The Malefactors Register* (London: J. Wenman, 1776), 258–59; James Mountague, *The Old Bailey Chronicle; or, The Malefactors Register: containing a circumstantial account of the lives . . . of . . . offenders who have suffered death . . . in England, Scotland, and Ireland, from . . . the Year 1700, etc. . . .* (London: N. P., 1783, repr. 1784, 1788), 1: 315–16; Christopher Hibbert, *The Road To Tyburn* (Cleveland, O.: The World Publishing Company, 1957), 108–09; G. H. Borrow, *Celebrated Trials and Remarkable Cases of Criminal Jurisprudence* (London: Carey, 1835), 3: 378–79; Knapp and Baldwin, *The Newgate Calendar,* 211; Bleackley, Jack Sheppard, 9.

The conditions in London prisons at that time defy description, for the prevalence of crime in the streets filled them with offenders indicted for the most violent crimes mixed together with those accused only of petty felonies. The overcrowding resulted in a dangerous infection that became known as "the gaol distemper" and proved to be so devastating that finally a ventilator was constructed on the roof of the prison to expel the foul air that permeated the interior.

Forced into the confining quarters with cutthroats, rapists and thieves of every description, the young apprentice contrasted vividly with his fellow cellmates by virtue of his nature and behavior. The constant confusion and noise were almost unbearable, and drunkenness and rioting were characteristic of London prisons in the eighteenth century, because drink was freely sold within the prison walls. Having lived a modest, well-regulated life, the proximity of the evil-smelling prisoners with their taunts and persecution must have caused him to regret his recent associations and to consider again and again the shame he had brought not only upon himself and his family, but also to his master. His apprenticeship had been approaching its end, and he saw it as a lost opportunity, with a most uncertain fate awaiting him.[5]

Lamb was held in prison for almost a full month after the commission of the crime before he was finally brought to trial. Then on 8 July he was removed from his cell and, walking in fetters, was conducted through the streets lined with idle and curious spectators to the Justice Hall of the Old Bailey for his trial. The substance of the courtroom events was dryly reported in *The Proceedings on the King's Commission of the Peace and Oyer and Terminer, and Gaol-Delivery of Newgate, held for the City of London and County of Middlesex* and related also in the *Annals of Newgate*.[6]

As the frightened Lamb stood in the prisoner's dock, Barton presented evidence for the prosecution.

Lamb's confession made to Justice Newton, which confirmed these events, was then read before the court, and made a part of the record.

Particularly damaging to Lamb was the evidence offered by the second witness for the prosecution, a tailor named Anthony Bragger (or Bragget). At the same time that Barton had been robbed, Bragger claimed to have had twelve yards of drugget stolen from him. He stated "the Prisoner told me . . . that if they would let him push off, he would help me to my Drugget again, and Mr. *Barton* should have his Goods again."

The records of the court noted "the Prisoner deny'd the Fact [that he had offered to return the goods], and pretended he was terrified into his Confession."

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[5] M. Dorothy George, *London Life in the XVIIIth Century* (London: Kegan Paul, Trench, Trubner & Co., Ltd., 1925), 300–04.

[6] *The Proceedings on the King's Commission of the Peace and Oyer and Terminer and Gaol-Delivery of Newgate, held for the City of London and County of Middlesex, at Justice Hall in the Old Bailey, on Wednesday, Thursday, and Friday, being the 8th, 9th, and 10th of July, in the Tenth Year of His Majesty's Reign* [1724].

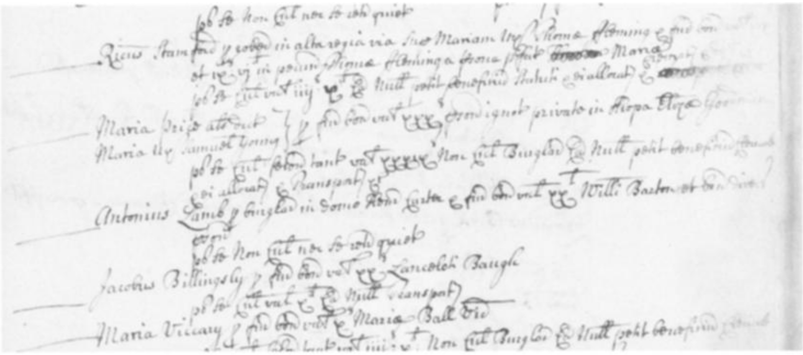

FIG. 4. Entry for Anthony Lamb in the *Gaol-Delivery Book* (MJ/GBB/309/72). Courtesy the Greater London Records Office, Middlesex Section.

The jury acquitted Lamb of the crime of burglary, and found him guilty of the felony only, to the value of thirty-nine shillings.[7]

The Benefit of Clergy

Upon receiving the verdict of the court, Lamb claimed benefit of clergy, to avoid the traditional penalties of whipping or "burning of the hand."

The benefit of clergy, or *privilegium clericale,* was a curious survival in eighteenth-century English law of a privilege which had existed from earliest times. Originally it was a right given to members of the clergy who had committed one of the graver crimes or felonies and enabled them to be exempt from the jurisdiction of the secular courts, and to be subject only to the courts of the church. At first the benefit was restricted only to monks and regularly ordained clerks. Then in 1350 the ordinance was extended to include anyone who could read.

After the abolition of the reading test in the reign of Queen Anne, the court could, in its discretion, order offenders convicted of grand or petty larceny or any form of stealing within clergy to be transported to the American colonies.[8]

Because his was a first offense, Lamb received what was described as a "favorable prosecution." Although the value of the goods stolen from Barton was considerably in excess of thirty-nine shillings, the custom of the court limited the amount so that Lamb received the customary leniency showed to those charged with housebreaking and larceny. He was therefore ordered to be transported to the American colonies.[9]

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[7] Villette, *The Annals of Newgate* 258–59; *The Proceedings* [1724].

[8] Luke Owen Pike, *A History of Crime in England Illustrating the Changes of the Laws in the Progress of Civilization* (Montclair, N.J.: Patterson Smith, 1968), 1: 297–303; A. L. Cross, "The English Criminal Law and Benefit of Clergy During the Eighteenth and Early Nineteenth Centuries," *American Historical Review,* 22, No. 3 (April 1917): 551–55.

[9] Greater London Record Office, Greater London Council, Middlesex Section. *Sessions of Gaol-Delivery of Newgate for Middlesex held at the Old Bailey on 8 July 1724* (MJ/SR/2427/34).

II. THE FATE OF FELONS

Transportation

Transportation was first attempted during the period of the Restoration, but it was not generally used until 1718. From that time until the beginning of the American Revolution, transportation became a common substitute for the death penalty. Imprisonment was reserved for those held for trial and for debtors. Because of the dreadful conditions within English prisons, most convicts considered transportation, which was equally dreadful, to be the lesser of the two evils.

The large numbers of felons who were convicted, and the difficulty of disposing of them while court was in session, created considerable suffering in the overcrowded prisons.

Convicted felons often underwent great hardships before they were embarked for the colonies. They were given into the charge of sheriffs to await the next jail delivery, without provision being made for them in the interim. Again and again the Council of State was petitioned by prisoners and sheriffs alike, requesting that power be given to the sheriffs to expedite orders for transportation. Sheriffs were not permitted to deliver felons to the transporters without having first obtained a license. To do so they often had to provide security that the felon, once delivered, would not return to England until he had served the full term of his banishment.[10]

The Convict Ships

A contractor was paid a sum of money by the British Treasury for each convict to compensate for the cost of feeding and clothing him while on shipboard and for transporting him across the ocean. The petitions for payment of these accounts submitted by the contractors had to be authorized and signed by appropriate officials including the Lord of the Treasury.

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[10] George, *London Life,* 145–48; George Ives, *A History of Penal Methods. Criminals, Witches, Lunatics* (London: Stanley Paul & Co., 1914), 108–23; Eugene Irving McCormac, *White Servitude in Maryland.* Johns Hopkins University Studies in Historical and Political Science, Series XXII, Nos. 3–4 (Baltimore: Johns Hopkins University Press, 1904), 92–106; A. G. L. Shaw, *Convicts and the Colonies* (London: Faber and Faber, 1966), 30–34; James Davis Butler, "British Convicts Shipped to American Colonies," *American Historical Review,* 2, No. 1 (October 1896): 12–25; (No author given), "Transportation of Felons to the Colonies," *Maryland Historical Magazine,* 26, No. 4 (December 1932): 263–74; Abbott Emerson Smith, *Colonists in Bondage. White Servitude and Convict Labor in America 1607–1776* (Chapel Hill: University of North Carolina Press, 1947), 110–32.

The jailer at Newgate or another prison provided the contractor with a document specifying the total number and individual names of the convicts to be transported. This had to be witnessed by the jailer or a guard who had observed their arrival on board. Once the convicts were safely embarked, the contractor was required to have the document signed by the ship's captain and other witnesses to that effect. It was then sent to the Treasury, copied into the Money Books, and payment was authorized.

An enterprising merchant named Jonathan Forward negotiated a contract with the Treasury by means of which he agreed to transport convicts on his ships the *Frigate Forward* and the *Jonathan* to connections he had in Maryland. He was paid three pounds each for felons from Newgate and five pounds for those from the provinces. Forward enjoyed a long and successful career of shipping convicts. He periodically raised his fees, and in 1721 he charged four pounds for felons from London and proportionately more for those from the provinces. The practice remained virtually unchanged throughout the remainder of the eighteenth century.

Forward paid all charges, including the costs of conveying convicts to the ships, for supplying irons, and rewarding the jailers. To ensure that the felons did not return to England until the period of their servitude had been completed, Forward provided bonds of forty pounds for each malefactor to be transported.

Shipments were made from London several times each year. The prisoners were taken from the jails and marched in irons on foot in a procession from the prison gates to Blackfriar's and the embankment of the Thames, where a lighter awaited to take them to the convict ship which was anchored in mid-river. Bystanders gathered in great numbers to hoot as they passed, and to throw mud and stones at them. The convicts frequently replied with wit and other times with abuse, and there was much shouting, rattling of chains with which they were bound, and the populace of London turned the diversion into a gala occasion.

Often the prisoners taken from London had to wait until contingents of others arrived from the counties while the convict ships remained at anchor in the river at London or Gravesend until the hold was filled with its human cargo. According to the court records, Lamb and his fellow convicts were sentenced in August but held in prison until 10 October 1724. On that date they were taken to the riverside and loaded on the lighter and taken to the frigate *Forward,* to begin their voyage to the colonies. Lamb remained confined in Newgate prison, through which more than seventeen thousand convicts passed on their way to the colonies, for three months before boarding ship.[11]

The convicts were kept in close confinement in chains below deck throughout the voyage. They were chained together in groups of six, and each group was provided with a stated amount of meat, bread, cheese,

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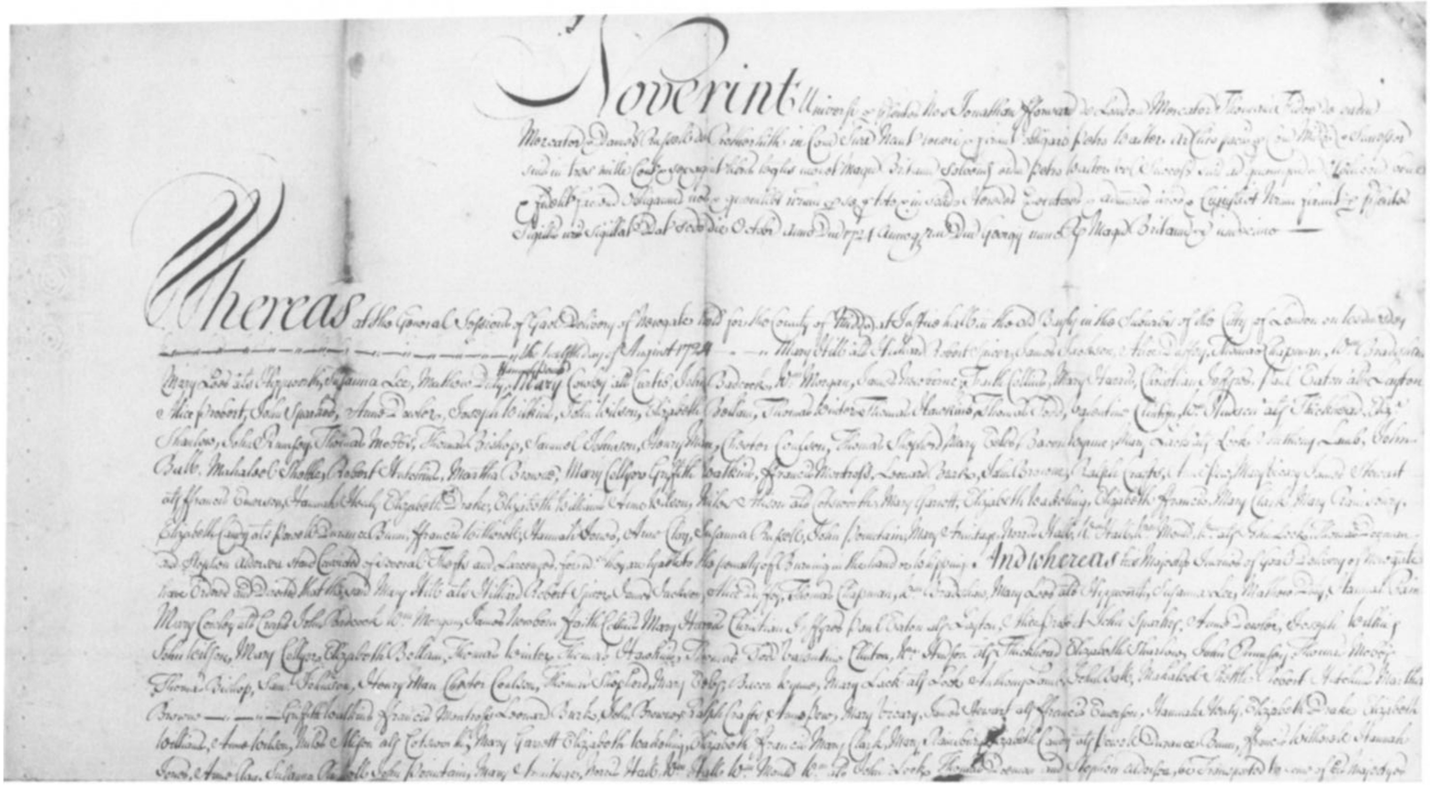
[11] Smith, *Colonists in Bondage,* 110–33.



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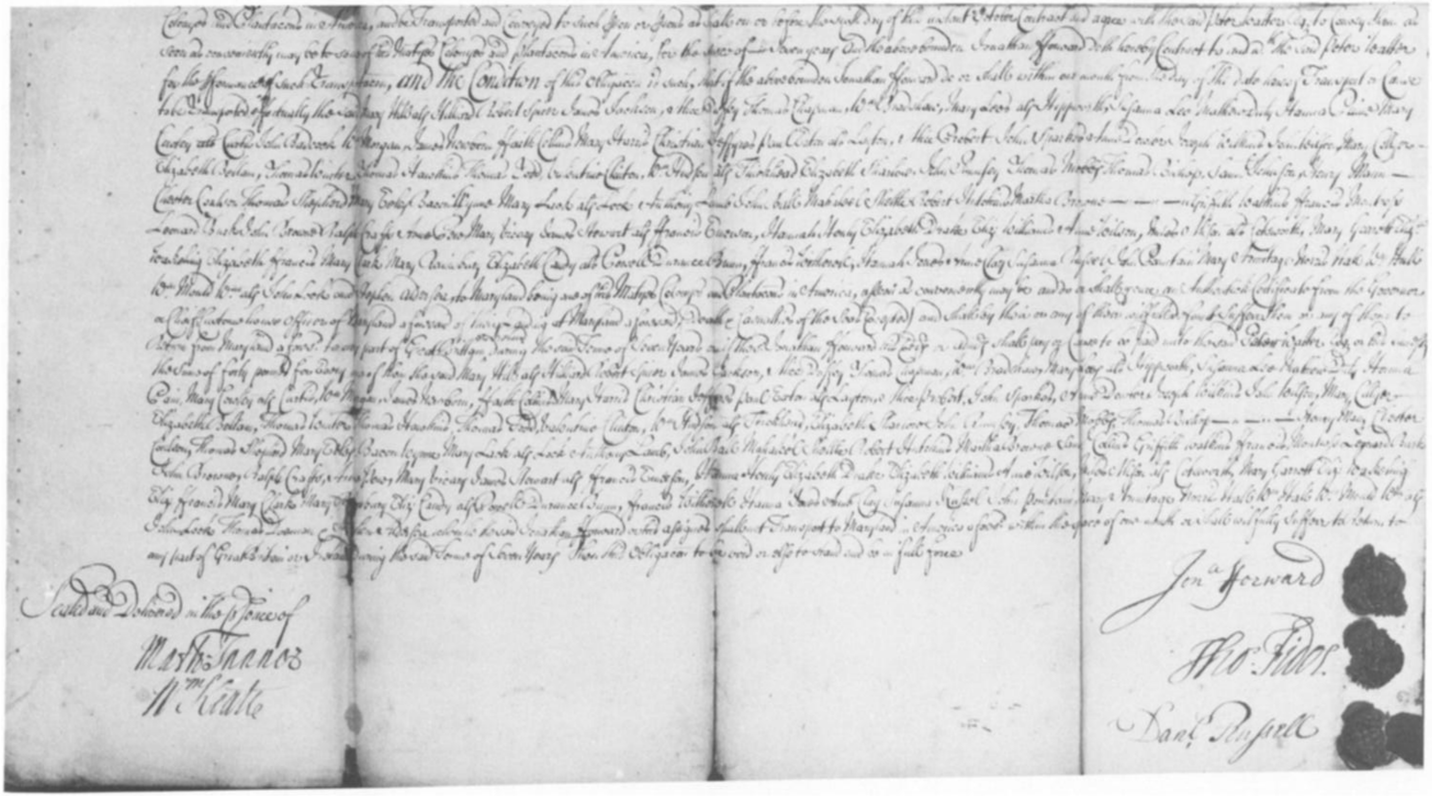

Bottom Half

FIG. 5. Transportation Bond taking delivery of Anthony Lamb and other convicted felons from Newgate prison by Jonathan Forward, Thomas Fidos, and Daniel Russell, for transporting to Maryland, dated 6 October 1724. (MJ/SPT/2/20). Courtesy the Greater London Records Office, Middlesex Section.

molasses, and oatmeal. Two portions of gin were provided to each group on every Saturday. Some greedy shipowners were occasionally inclined to use ships that were too small to carry an adequate food supply, sufficient clothing, or provide adequate ventilation for voyages that often required as long as eleven weeks.

Conditions below deck were incredibly bad and could be compared only with those in the London prisons. A visitor to one of the convict ships reported having seen more than fifty men, each chained to a board in a hold less than sixteen feet long, and each having a padlocked collar around his neck and chained together with five others. There was a high mortality on these voyages, as much as 15 per cent of the human cargo succumbing from jail fever and smallpox, leading Forward to request a regular subsidy from the Treasury to cover his losses from "death, sickness, and other accidents." The suffering of the convicts on shipboard was such that they often claimed they would rather be hanged than suffer a second voyage. Those who survived also suffered from the changes in climate different from that to which they had been accustomed, but their new life at physical labor in the open air with adequate food generally resulted in rehabilitation.[12]

Disembarkation

The *Forward* collected convicts from the counties of Kent, Hertford, and Surrey after leaving London dock and finally sailed from England on 13 October, with a scheduled arrival date at the port of Annapolis at the end of December 1724. The shipment included eighty-eight male and fifty-five female convicts, according to "A List of Convicted Persons Transported from London Piere in the Ship Forward of London Captain Daniel Russell Commander," which was later filed with the Treasury in London. The name of Anthony Lamb was the forty-first name on the list, which also included names of other associates of Jack Sheppard who had been arrested at the same time, among them his brother Thomas.[13]

Following the customary procedure upon arrival at the port of destination, the captain ordered the male convicts to shave and the women to don their best dresses. Then they were brought out of the hold and still in chains, marched along the riverside. Amidst considerable confusion they were counted and made to answer a roll call, against a background of shouting, cursing, and the jangling of chains. The captain had a hogshead of rum brought on board and invited the planters to partake of his hospitality. They came to seek out joiners, carpenters, blacksmiths, weavers, tailors, and men having other useful trades, from among the prisoners while the punchbowl was frequently refilled. Convicts with no skills would use their powers of persuasion to convince potential purchasers that they were masters of trades in order to obtain better treatment. Ten pounds were generally paid for males and eight or nine pounds for female convicts. Those trained in useful trades sold for fifteen to twenty-five pounds.

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[12] Marion and Jack Kaminkow, *Original Lists of Emigrants in Bondage from London to the American Colonies 1719–1744* (Baltimore: Magna Carta Book Company, 1967), vii–xvii; McCormac, *White Servitude* 94–95; Henry F. Thompson, "An Atlantic Voyage in the Seventeenth Century," *Maryland Historical Magazine*, II, No. 4 (December 1907): 320–26.

[13] Kaminkow, *Original Lists* 96, 184–85; Greater London Record Office, Greater London Council, Middlesex Section. *Gaol-Delivery Book* (MJ/GBB/309/72), entry for Anthony Lamb; Corporation of London, Records Office, Guildhall. *A List of Convicted Persons in the Ship Forward of London Captain Daniel Russell Commander*, with *Certificate of Arrival* (57.7.[20]).

The legal status of convicts upon arrival in the colonies was much the same as that of other servants. They were not subject to military service, however, and prior to 1751 their oath was not accepted in court. As the numbers of transported convicts increased, the servant class in the colonies became more degraded because of the considerable growth of crimes and misdemeanors. Masters generally provided little restraint except in their own interests.

As was to be expected, this great influx of convicted felons pouring into Virginia and Maryland was not welcomed by everyone, for each new shipment brought with it a potential increase of lawlessness and crime. However, the colonies found themselves powerless to limit the importation. In an effort to control the problem in 1721 Maryland declared that all transported convicts were to be considered persons "of Evill fame" and that security might be taken from them by justices of the peace for their good behavior. This order was reinforced repeatedly in the next several years. The ruling became mandatory and a security of fifteen pounds per imported convict was required. As a consequence, shortly before Lamb's arrival a great dispute arose between Forward's agents at Annapolis and the magistrates when the former refused to submit the required bonds. The corporation of Annapolis was brought in to resolve the problem, and found in favor of the magistrates.[14]

Filed with the Transportation Bond for the voyage on which Lamb was transported is the certification signed by Benjamin Trasker, an official of the port of Annapolis, stating

> These are to Certifie to all whom it doth concern that the within mentioned persons were here Imported in the ship the Forward frigate Capt. Dan.^{ll} Russell Commander from London and that the same persons upon being called over did severally answer to their names. Given under my hand and Seale this 25th day of June in the Eleventh Year of the Reign of Our Sovereign Lord George King of Great Britain Anno Dom. 1725.[15]

At first glance the date of the certification presents a puzzle, for it indicates that the voyage required some thirty-six weeks instead of the

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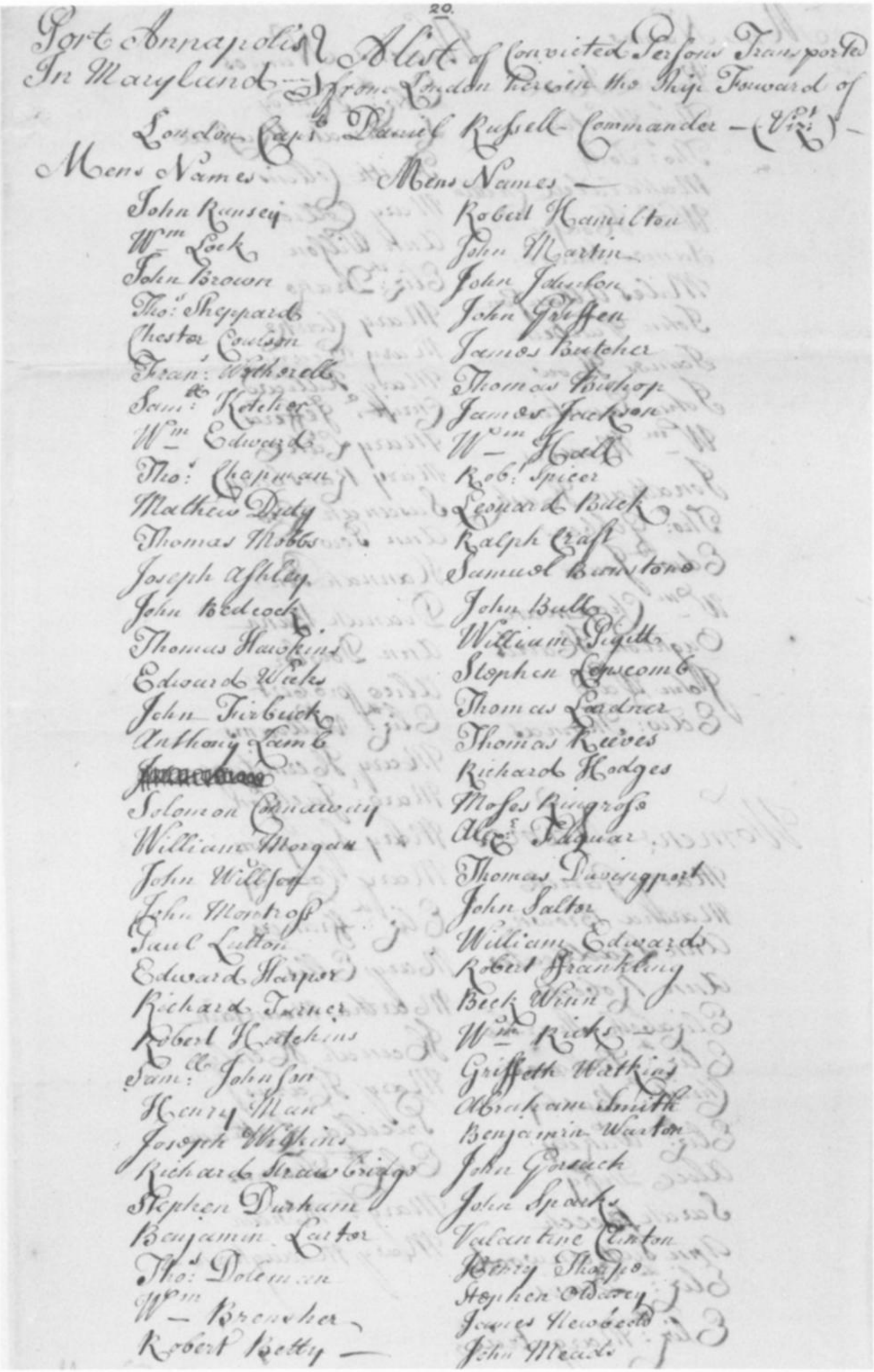
[14] Basil Sollers, "Transported Convict Laborers in Maryland During the Colonial Period," *Maryland Historical Magazine,* 2 (1907): 28–33.

[15] Corporation of London, Records Office, Guildhall. *Certificate of Arrival* of the frigate *Forward,* 25 June 1725 (57.7.[20]).



20.

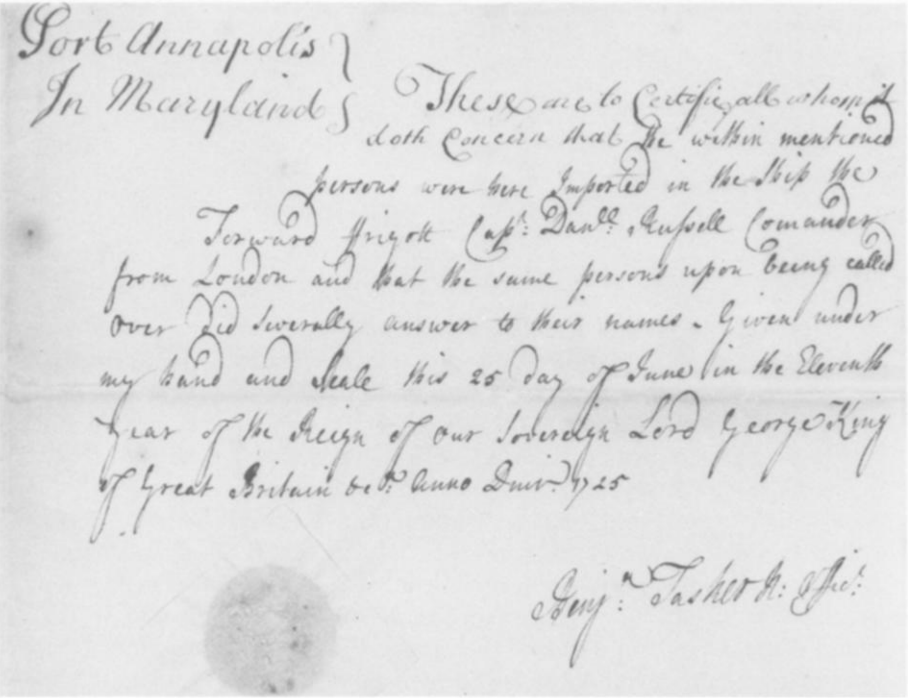
Port Annapolis In Maryland — A List of Convicted Persons Transported from London hereon the Ship Forward of London Capt. Daniel Russell Commander — (Viz.) —

Mens Names

John Ramsey
Wm Lock
John Brown
Thos: Sheppard
Chester Coulson
Fran: Wetherell
Saml: Kelcher
Wm Edwards
Thos: Chapman
Mathew Dudy
Thomas Mobbs
Joseph Ashley
John Bedcock
Thomas Hawkins
Edward Weeks
John Firbuck
Anthony Lamb
[redacted]
Solomon Connaway
William Morgan
John Willson
John Montross
Paul Lutton
Edward Harper
Richard Turner
Robert Hutchins
Saml: Johnson
Henry Man
Joseph Wilkins
Richard Strawbridge
Stephen Durham
Benjamin Lector
Thos: Doleman
Wm Brensher
Robert Betty —

Mens Names —

Robert Hamilton
John Martin
John Johnson
John Griffen
James Butcher
Thomas Bishop
James Jackson
Wm Hall
Robt: Spicer
Leonard Buck
Ralph Craft
Samuel Burnstone
John Bull
William Pigill
Stephen Luscomb
Thomas Lardner
Thomas Reeves
Richard Hodges
Moses Ringross
Alexr: Fulquar
Thomas Davenport
John Salter
William Edwards
Robert Frankling
Beck Winn
Wm Ricks
Griffeth Watkins
Abraham Smith
Benjamin Warton
John Gorsuch
John Sparks
Valentine Clinton
Henry Tharpe
Stephen Oldacey
James Newbold
John Meads



Port Annapolis }
In Maryland }
These are to Certifie all whom it doth Concern that the within mentioned persons were here Imported in the Ship the Forward Frigott Capt: Danll: Russell Commander from London and that the same persons upon being called Over did Severally answer to their names. Given under my hand and Seale this 25 day of June in the Eleventh Year of the Reign of our Sovereign Lord George King of Great Britain &c. Anno Dmi 1725

Benj: Tasker N: Offic:

FIG. 6. "A list of convicted persons Transported from London Piere in the Ship Forward of London Capt. Daniel Russell Commander . . ." with the appended certificate of arrival. Lamb's name is the seventeenth on the list. The certificate, dated 25 June 1725, was probably signed by the Annapolis port officials on a later voyage of the *Forward.* [Ref. 57.7. (20)]. Courtesy the Corporation of London. Records Office, Guildhall.

customary eleven or twelve weeks. However, shipmasters of that period were notorious for their poor record-keeping, and frequently failed to file the completed bonds upon their return to London, often waiting until several voyages had been completed before obtaining certification for them and submitting them to the Treasury. This was obviously the case with Captain Russell's October voyage. The name of Lamb was the seventeenth on the list of convicts disembarked.[16]

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[16] Kaminkow, *Original Lists* 96, 184–85; Peter Wilson Coldham, compiler, *English Convicts in Colonial America* (New Orleans: Polyanthos, 1974), 1. Middlesex: 1617–1775, p. 160.

III. THE BRAVE NEW WORLD

The Missing Years

From the date of disembarkation at Annapolis in December 1724 until early December 1730, when he appeared in New York, no trace can be found of Anthony Lamb in the American colonies. There is no record of his purchase by a planter or a craftsman or other professional of Maryland or of the adjoining colonies. Because he was skilled as a maker of mathematical instruments, and as an engraver of metal, ivory and wood, it is most likely that he would have been purchased by a printer, a clock or watchmaker, or possibly a gold or silversmith. The Land Records of Anne Arundel County in Maryland noted few such craftsmen. Joseph Stanley was listed as a watchmaker in 1715; Philip Syng and William Woodward as goldsmiths in 1734. By the 1740s the records included a watchmaker named John Davis, Samuel Souiman as a goldsmith, and Thomas Williamson as an engraver. Lamb could have been indentured to one of these. However, his name is not included in the Annapolis Mayors Court Proceedings, Anne Arundel County Judgements, Anne Arundel Land Records, St. Anne's Protestant Episcopal Church Register, Provincial Court Judgements, Chancery Records, nor does he appear in advertisements in the *Maryland Gazette* from 1728 to 1729.

The names of convicts who had been imported were often listed in the local county court records for the protection of the inhabitants. However, these records for Anne Arundel County no longer exist. Inasmuch as no trace of Lamb's presence in Maryland can be found, the possibility exists that he paid for his own transportation, or more likely, that it had been paid for by his family or possibly his former master.[17] The cost was not excessive, only four pounds at this time. In such a case, he then arrived at Annapolis a free man, able to go where he wished, with the only restriction being that he could not return to England within the period of seven years. William Eddis commented, "If they are able to pay the expense of passage, they are free to pursue their fortune agreeably to their inclinations or abilities. Few, however, had means to avail themselves of this advantage."[18]

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[17] The writer's correspondence with Mrs. Bryce Jacobsen, State of Maryland Hall of Records, 8 June 1973 and 4 November 1981; and with Frederick H. Schmidt, *The Papers of George Washington*, University of Virginia, March 6, 1973.

[18] William Eddis, *Letters From America. Historical and Descriptive, Comprising Occurrences From 1769 to 1777 Inclusive* (London: Printed for the Author, 1792), 66–67.

One can only speculate what transpired during those missing years. Although there would have been opportunities to use his skills in Annapolis or possibly elsewhere in Maryland or Virginia, Lamb probably wished to move away as quickly as possible from the region where he would be known as a convicted felon even if he found employment. In Maryland particularly even the most law-abiding former convict was not looked upon with favor.

"Those who survive the term of servitude seldom establish residence in this country," wrote Eddis in 1792,

> the stamp of infamy is too strong upon them to be easily erased; they either return to Europe and renew their former practices, or if they have fortunately imbibed habits of honesty and industry, they remove to a distant situation, where they may hope to remain unknown, and be enabled to pursue with credit every possible method of becoming useful members of society.[19]

Since his talents were closely related to navigation, he might have chosen Philadelphia over another large city such as Williamsburg because it would afford more opportunities. Without tools or shop equipment he would have to seek employment with an established silver or goldsmith or clockmaker, for which he could work as an engraver, inasmuch as no makers of mathematical instruments were at work in Philadelphia or other cities of the Middle Colonies at the time of his arrival.

The name of Lamb was not common but nonetheless prevalent in Pennsylvania, Virginia, and Maryland in the early eighteenth century. For example, Anthony Lamb is not to be confused with Andrew Lamb, who was a teacher of mathematics, surveying, navigation, Italian bookkeeping, and writing for a period of twenty-six years. He had practical experience in Navigation, as he advertised, and had kept

> Journals from England to Cape Henlopen (or Cape James) in America; and from thence to the Lizard Point again, I have proved to be within one Degree of Longitude, (near 140 Degrees of West Longitude) as appears in my Journals to be produced with others of the like Sort, and are good proofs of my Principles. . . .

He went on to add "I have taught Navigation, and kept a Journal about 40 Years; the Scheme is new, and never was in printed Books, and has been approved of by proper Judges, &c." Andrew Lamb maintained his school, in which he taught day and night classes, at John Johnston's on Front-street in Philadelphia.[20]

Nor is Anthony Lamb the mathematical instrument maker of New York to be associated with two Lamb families, of York and Charles City Counties in Virginia and Kent County in Maryland, in which the names "Anthony" and "John" frequently appeared in the eighteenth century.[21]

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[19] Eddis, *Letters from America,* 66–67, 74–75.

[20] Carl and Jessica Bridenbaugh, *Rebels and Gentlemen. Philadelphia in the Age of Franklin* (New York: Reynal & Hitchcock, 1942), 38–39; J. Leander Bishop, *A History of American Manufacture From 1608–1860* (Philadelphia: Edward Young & Co., 1861), 1: 538; *Pennsylvania Gazette,* 23 October and 6 November 1755.

"At the Sign of the Compass and Quadrant"

The name of Anthony Lamb is brought to light in the colonies for the first time in the advertisement which appeared in the pages of the *Pennsylvania Gazette,* published in Philadelphia by Benjamin Franklin, in the issue of 26 November–3 December 1730:

> ANTHONY LAMB, Mathematical Instrument-maker, from *London,* now living in *New York,* near the New Dock, at the sign of the Compass and Quadrant, makes and sells all Sorts of Instruments for Sea or Land, as Compasses, Quadrants, Forestaffs, Nocturnals, Sectors, Protractors, all sorts of Scales, Gauging-Rods, and Rules, in Wood, Ivory, Brass or Silver; also any other small Work by Wholesale or Retale.[22]

The advertisement was repeated verbatim in the issues of 8 December–15 December 1730 and 18 March–25 March 1731. (*Figure 8*) Entries in Franklin's *Ledger Book A & B* indicate that Lamb paid three shillings for each appearance, and that he had submitted the text from New York.[23]

The *Pennsylvania Gazette* had a wide readership in the Middle Colonies and elsewhere, and by its means Lamb was able to bring his new shop to the notice of shipmasters and others requiring instruments not only in Philadelphia but on the eastern shore of Maryland and elsewhere in Pennsylvania as well.

Lamb did not advertise his shop in New York, although newspapers such as *The New-York Gazette* existed at that time.

No makers of mathematical instruments are known to have been at work in Philadelphia or New York during this period, and none advertised until later in the eighteenth century. The earliest mention of a craftsman who was concerned with scientific instruments in Philadelphia was Peter Stretch (1670–1746), a Quaker clockmaker. In 1733 he had provided Thomas Penn, the Proprietor, with a number of scales and weights, and "two needles for Surveying & a Contor [sic]."[24]

With the considerable amount of shipping that arrived and departed from Philadelphia harbor, however, undoubtedly there were craftsmen capable of rendering such necessary assistance to shipmasters as "touching" compasses, repairing backstaffs, forestaffs, and marine compasses, even if they did not produce them. Lamb may have been employed by one of

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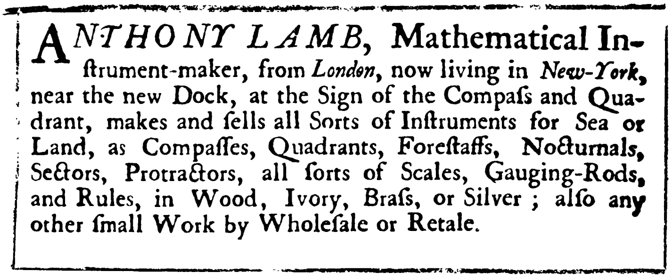
[21] [Judge James C. Lamb], "The Lamb Family," *William and Mary Quarterly Historical Magazine,* 7 (1899): 51–54, 109–12, 203–04.

[22] *Pennsylvania Gazette,* issues of 26 November–3 December 1730, 8 December–15 December 1730, and 18 March–25 March 1731.

[23] American Philosophical Society, Manuscripts Division, *The Papers of Benjamin Franklin.* Ledger Book A & B, 1730, p. 28.

[24] Historical Society of Pennsylvania, Manuscripts Division, *The Penn Family Papers.* Invoice from Peter Stretch to Thomas Penn, 10 November 1733.



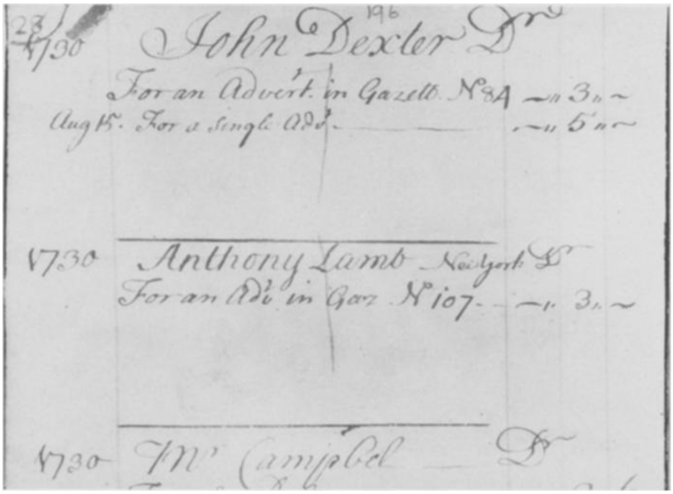
ANTHONY LAMB, Mathematical Inſtrument-maker, from *London*, now living in *New-York*, near the new Dock, at the Sign of the Compaſs and Quadrant, makes and ſells all Sorts of Inſtruments for Sea or Land, as Compaſſes, Quadrants, Foreſtaffs, Nocturnals, Sectors, Protractors, all ſorts of Scales, Gauging-Rods, and Rules, in Wood, Ivory, Braſs, or Silver ; alſo any other ſmall Work by Wholeſale or Retale.

FIG. 7. Advertisement of Anthony Lamb for his shop "At the Sign of the Compass and Quadrant" in New York. From the *Pennsylvania Gazette,* issues of 26 November–3 December and 8 December–15 December 1730, and 18 March–25 March 1731.

these craftsmen located along the waterfront, if in fact he was not employed in another craft. During this period he apparently saved as much as possible from his earnings until he had amassed sufficient funds to purchase stocks of materials and for his travel.

It is not possible to ascertain just when Lamb opened his shop in New York, but it is probable that he had already done so at the time that he advertised, despite the city regulations that he must first be accepted as a freeman. These requirements were not strictly enforced. He was at that time the only one pursuing his craft in New York, and it was not until several decades later that another established himself there, so that Lamb had the exclusive trade of all shipmasters and others who sought his services.

There is every evidence that Lamb was immediately successful, for he was capable of making and repairing any instrument a shipmaster might



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28 1730 John Dexter Dr

For an Advert. in Gazette No 84 — 3 —

Aug 15. For a Single Advt. — 5 —

1730 Anthony Lamb New York Dr

For an Advt. in Gaz. No 107 — 3 —

1730 Mr Campbel Dr

FIG. 8. Entry in Benjamin Franklin's Ledger Book A & B, 1730, for Lamb's payment for his advertisement in the *Pennsylvania Gazette.* Courtesy the American Philosophical Society.

require. At first he undoubtedly worked alone, without an assistant or apprentice, until the volume of business justified expansion. The West India trade in which New York was engaged was of considerable importance. Goods shipped from the city were exchanged for English manu-

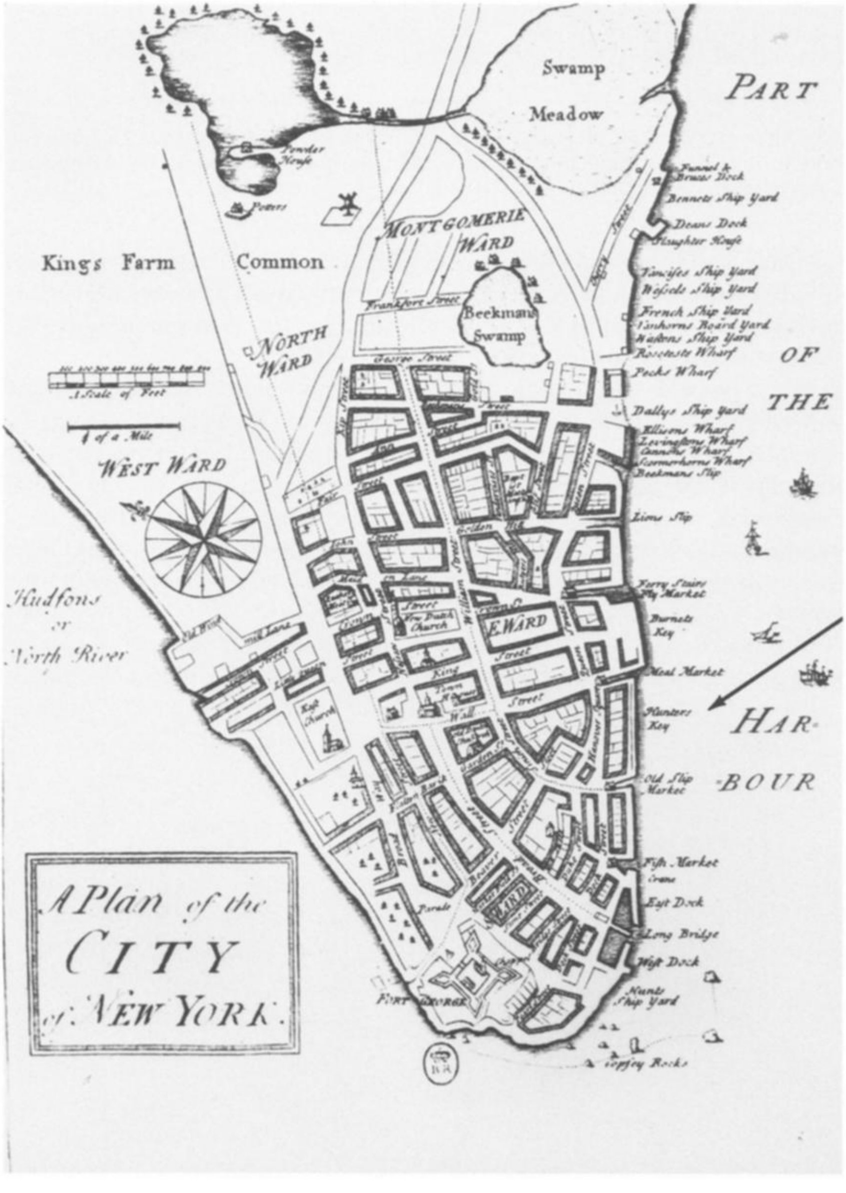

FIG. 9. "A Plan of the City of New York [and] A Plan of the Harbour of New York," engraved by I. Carwitham ca. 1735. Unique copy in the Bibliothèque Nationale, Paris. Date depicted ca. 1730. The Old Slip, Hunter's Key and other waterfront sites are identified. From *The Iconography of Manhattan Island 1498-1909* by I. N. Phelps Stokes (New York, 1922), 1, plate 27a. Courtesy the Smithsonian Institution Libraries.

factures needed in the colonies. A coastwise trade was also maintained, and there was considerble shipbuilding. Between 1729 and 1730, 211 vessels entered and 222 vessels cleared the port of New York.

A major obstacle to shipping at this time was the frequent piracy against merchant vessels on the high seas, and the leniency of the government in controlling the practice. Pirates often cruised offshore and occasionally sailed even into port. In time, however, punitive action was taken and the harbor expanded and shipping increased considerably.

At this time the eastern side of lower Manhattan was being developed much faster than the west side, and practically all of the city's business was concentrated on or near the East River front. All of the city's shipping was harbored between the docks on Whitehall Street northward to Roosevelt's Wharf for the practical reason that salt water did not freeze and shipping was accordingly protected from ice in the winter. It was for the same reason that the shipbuilding yards were located on the East River front, as well as the merchants' warehouses, and all the major shops seeking the Long Island trade.

New Dock, fronting on the East River where Lamb established his shop, was also known in various periods as the Great Dock and later as the East and West Docks. It stretched in two directions on Water Street from Whitehall Slip to Coentis Slip, the entrance being in front of Broad Street. Construction of the Dock was begun in 1676 and completed three years later, with the Meat Market adjacent to it. Nearby to Lamb's shop was a popular rendezvous, "At the Sign of the Loudon's Arms," a tavern kept by the widow Vernon where the meetings of the St. Andrew's Society were held.[25]

The Mathematical Instrument Maker's Role

It is difficult at first to associate the crude sounds and smells of the primitive New York waterfront of the early eighteenth century with the highly specialized craft which produced bright and shiny instruments of wood and brass and requiring at least modest mathematical skills to make and use. These products of the mathematical instrument makers were the tools required by the several professions which modern historians have designated as those of the mathematical practitioners, "the little men of science" whose work was essential to the colonization of the New World and its development as a nation.

These practitioners pursued the "practical" sciences, and included the cartographers who explored and mapped the wilderness at the time of arrival, the navigators who at first charted the inland and coastal waterways and now sailed the seas in the development of trade, the surveyors who defined local and territorial boundaries, the self-taught teachers who trained others in these sciences, and the occasional amateur who calculated ephemerides for almanacs or pursued scientific studies. Included in this category were the instrument makers like Lamb, who furnished their scientific tools. Their individual contributions were modest at best, but when taken together, their combined efforts proved to be of considerable significance. By the nature of their work, they remained for the most part obscure, and few of them are noted in the pages of history.

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[25] I. N. Phelps Stokes, *The Iconography of Manhattan Island 1498–1909* (New York: Robert H. Dodds, 1922), 4: 718–990.

The mathematical instruments produced by Lamb and other makers were relatively simple when compared with modern instrumentation, but they were nonetheless essential and required a combination of skills to produce. In almost every instance they were instruments for angle measurement, requiring graduated scales precisely inscribed, and made of brass and wood for the most part, although silver and ivory were used in rare examples.

The cartographers and surveyors in the colonies generally used the plane table, the plain surveying compass, and the theodolite in addition to the full range of drafting instruments: compasses, dividers, protractors, pencils, pens, et al. The navigator required a marine compass, a forestaff, which by the early eighteenth century had been superseded by the Davis improved quadrant or backstaff, the azimuth compass, the log-ship and line, the quadrant, nocturnal, gunter's scale, globe, artificial horizon and a variety of nautical charts and tables. Rarely, however, was a shipmaster equipped with all of these items, although he would always have a backstaff and a marine compass in addition to his charts.

Although all of these instruments and aids were available in England, where the instrument makers were organized in the London companies with a traditional program of apprenticeship by means of which they were professionally trained, they were costly and difficult for the colonists to purchase. Other than the relatively few examples owned by shipmasters engaging in trade with the colonies, few if any of these instruments were brought to the New World by its settlers.

Nonetheless the need existed and grew, and since they were unable to purchase them from the motherland, the colonists responded by finding means to produce the instruments themselves. They borrowed the skills of the silversmith and clockmaker and the brass founder to cast and engrave instruments in brass, and the talents of the joiner and engraver were adapted for the production of instruments of wood.

The engraver's greatest challenge was in dividing and engraving accurate scales. This was overcome by copying other instruments, using a scale of equal parts and graving tools.

Lacking more professional examples, these locally made instruments served most purposes of the time. Since they were required in only modest numbers at first, the makers pursued other trades as well. A major problem which faced the colonial maker of mathematical instruments, and which he shared with the clockmaker and related craftsmen, was the scarcity of suitable materials required for making their products, such as brass, ivory, and tropical woods.

All the brass used in the colonies was imported from England, where the materials of which it was composed, copper and zinc, were readily available. Brass was shipped in the form of ingots or sheets brought as ballast. The expense of shipping added to the initial cost made it, and the objects produced with it, extremely costly to the colonists. It was not until after the first quarter of the nineteenth century that the first American brass was commercially produced.

As a consequence, colonial clockmakers and instrument makers frequently advertised that they would pay good prices for broken or discarded utensils made of brass or copper. In one of Lamb's few advertisements, he particularly noted that he paid "Ready money for curious hard Wood, Ivory, Tortois-Shell, or old Brass." The pieces of old metal were made reusable by a process called *cementation.* The metal was broken up and placed in closed crucibles together with specified proportions of copper cut in strips or in the form of shot, and charcoal. To this mixture was added calcined calamine, or native carbonate of zinc. Brought to a great heat, the volatile zinc fused with the other metals to form new brass, which was then poured into granite or slate molds of the forms desired. For this process the calamine also had to be imported from England.

The scarcity of metal led the colonists to seek substitutes when possible, particularly for making the larger instruments, such as surveying compasses requiring substantial amounts of brass. In New England the Yankee whittlers had long discovered that they were surrounded by forests having a wealth of native hardwoods which they proceeded to utilize. Black walnut, apple, hickory, and rock maple proved to be adaptable substitutes for metal. By the simple expedient of utilizing the engraved paper compass card used in marine compasses, the resourceful New Englanders produced adequate surveying compasses by carving the base and the sights of wood, adding a magnetized needle to the compass card and enclosing it with a glass panel set in putty. A large number of these wooden surveying instruments were produced by makers of navigational instruments.

One of the most important elements of American colonial life was water transportation, inland and coastal, and on the open sea. It provided not only food for home consumption and trade, but also the only means of communication between the homeland and the New World. Colonial American ships began to develop an important trade in tobacco, lumber, fish, rice and indigo with markets in England and the West Indies.

The increase in trade brought a greater demand for navigational instruments, most of which were made of tropical woods. These woods were most adaptable because they were close-grained and contained oils which made the wood impervious to moisture and salt air. These same woods were also prized by makers of fine furniture, and had to be imported from England by them. Among those most generally used for instruments for sea use were lignum vitae, ebony, rosewood, mahogany, and boxwood. These woods were costly and available in small quantities, brought into colonial ports by privateers from captured Spanish and French ships en route to Europe. They were sold at public auction in the port cities, and it was not until later in the eighteenth century that these materials were imported in sufficient quantity from the West Indies and other ports by the colonial shipping trade.

The navigational instruments used in the colonies were relatively simple. A cross-staff or forestaff, and the Davis quadrant or backstaff which replaced it, was used for taking the altitude of the sun or a star for establishing the latitude. The forestaff consisted of a square rod approximately thirty inches in length and one-half inch in diameter, inscribed with scales on all four sides. Three or four transversals or slabs of wood were fitted to the staff so that they could be moved forward or backward. The backstaff consisted of a wooden frame having a large and a small arc, and fitted with a horizon vane, an eye vane and a shadow vane. The two arcs were graduated with scales.

The quadrant, which was made of brass or wood, was used to observe vertical angles and was formed as a right-angled sector of a circle, having sights and a plummet. A nocturnal, for determining the time at night from observation of either the Great Bear or Little Bear, consisted of two disks attached to each other, the larger of which had a handle and was inscribed with the months and days of the year. The inner disk, which was graduated for the hours, had an index arm. The Pole Star was sighted through an opening at the center of the instrument, and was moved to the correct date and aligned the index arm with the two stars known as the pointers or guards.

Universal ring dials were also popular in this period as a form of portable sundial convenient for use on shipboard when exact knowledge of the exact north or south directions was not available. The most common of all navigational instruments was the marine compass, which consisted primarily of an engraved paper compass rose having a magnetized wire attached to its underside and pivoted on a brass pin within a protective wooden box with a glass cover.

Also essential to the shipmaster were marine charts and plotting instruments and scales for measuring distances on them. These consisted of the sector, single and double-rulers, plotting dividers, protractors, and other drafting tools. Two practical "instruments" that did not require considerable skill to make were the log-ship and line for determining the ship's speed, and the lead-line for taking soundings.

The marine compass was readily produced by colonial makers, and it is likely that occasionally they succeeded in producing practical versions of more complicated instruments, such as the forestaff, backstaff, and nocturnal by the simple expedient of copying scales from English-made examples.[26]

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[26] E. G. R. Taylor, *The Mathematical Practitioners of Tudor and Stuart England* (Cambridge: At the University Press, 1954), 7–48; Derek J. de Solla Price, *Science Since Babylon* (New Haven: Yale University Press, 1961, repr. 1975), 101–02; Bedini, *Thinkers and Tinkers*, 23–29. The phrase "little men of science" to describe the mathematical practitioner movement was coined by Professor Price.

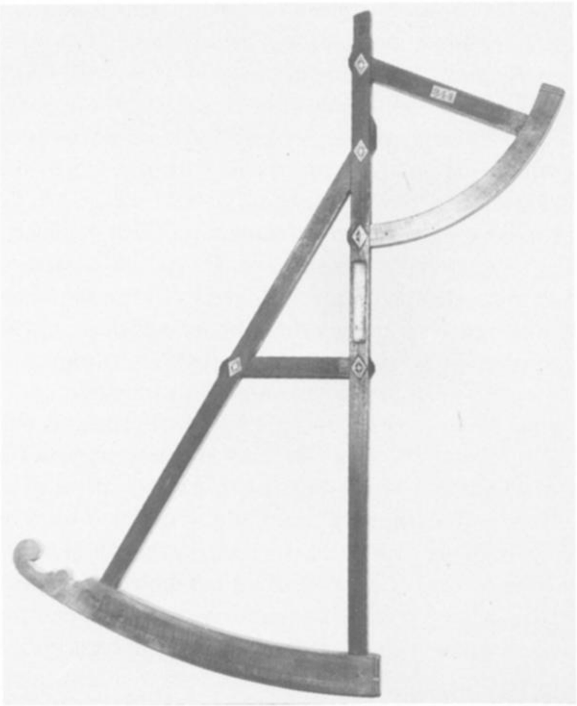

FIG. 10. Backstaff made and signed by Anthony Lamb. Courtesy the Newport (R.I.) Historical Society.

Few of the wooden navigational instruments used in navigation in the seventeenth and eighteenth centuries have survived because of the perishable nature of the materials of which they were made. The examples which have survived confirm that they were being made in Boston and Salem, Massachusetts, possibly in the late seventeenth and certainly in the early eighteenth centuries. Little is known about their makers, the earliest of whom was James Halsie of Boston, who signed a backstaff made entirely of pearwood and dated 1676. His name first appeared in Boston city records in 1669/70 and his death was recorded in 1696. A similar

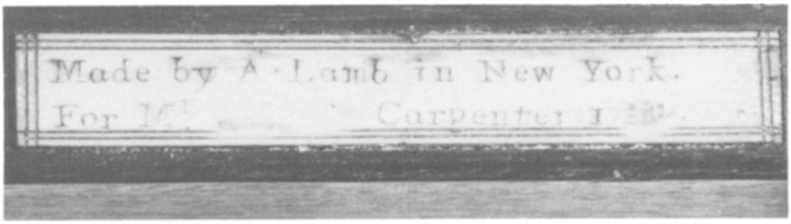

FIG. 11. Detail of the ivory name plaque inscribed "Made by A. Lamb of New York for M^{r}. . . . Carpenter. 17 . . ." Courtesy the Newport (R.I.) Historical Society.

instrument, signed by Joseph Halsey of Boston and dated 1702, suggests that the maker may have been a son or nephew of James Halsie and possibly trained by him. Working in the same period as Joseph Halsey was John Halsey, stated also to have been an instrument maker. At about the same time that Lamb arrived in New York, Thomas Greenough also began making surveying and navigational instruments in Boston. It is likely that he had been trained by one of the Halseys.

Other than the several instrument makers working in Boston, no others were noted in newspaper advertisements or public records of the other colonies in that period. Although the need for these instruments was present, there was not a sufficient demand to support more than an occasional craftsman full time, and those who made instruments often pursued another trade or craft. Repairs to navigational instruments undoubtedly could be executed by joiners or others skilled in working with wood.

Those instrument makers, who later established themselves chiefly in port cities, also advertised and sold instruments and other related items imported from England. Although Lamb also advertised such miscellaneous items for sale, it is likely that he also made most of them. As the only professionally trained maker of mathematical instruments in the colonies, he had special skills which included engraving and ivory turning which were not prevalent among other early makers. His presence on the New York waterfront during the period of substantial increase in shipping from that port proved to be fortuitous not only for shipmasters coming into and leaving that port, but also for the young craftsman establishing his own business for the first time.[27]

Freeman of the City

The name of Anthony Lamb first appeared on the records of New York on 4 May 1731 on the Roll of Freemen, which noted that on that date he had been made a freeman of the city in the fifth year of the mayoralty of Robert Lurting. He was inscribed on the Rolls as a "Mathematical Instrument Maker."[28]

Admission as a "Freeman" required that the applicant be chosen by the city authorities, that he take an oath of fidelity to the city, that he pay the fees prescribed, and that he be duly registered. Having met all these requirements, he was then permitted to engage in business. The oath of fidelity at the time of Lamb's admission required that he swear fidelity to King George the Second and his heirs, obedience to the mayor and ministers of the city, and to its franchise and customs. He was to contribute "to all manner of Charges within this City, as Summons Watches, Contributions, Taxes, Tallages, Lot and Scot, and all other charges bearing your part as a Freeman ought to do." Furthermore, he was in honor bound to warn the mayor of any gathering, "Conventicles," or conspiracies against the king's peace. Only freemen were permitted to keep shop or sell goods or wares or exercise any handicraft, trade, or occupation under penalty of law. All inhabitants that were natural born, naturalized, or denizens of the city at the time that the charter was granted were also deemed freemen.

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[27] Bedini, *Early American Scientific Instruments,* 65–92.

[28] *The Burghers of Amsterdam and the Freemen of New York 1675–1866.* Collections of The New-York Historical Society For the Year 1885 (New York: Printed for the Society, 1866), 117; James Grant Wilson, *The Memorial History of the City of New-York From Its First Settlement to the Year 1892* (New York: New-York History Society, 1892), 2: 206.

However, no instances of prosecution for violation of ordinances appear in the city records, and for many years the institution of freemanship served primarily a political advantage, securing for him insurance against prosecution by future changes in policy, and qualified him for municipal office. It is entirely possible that Lamb had been working in New York as a merchant or craftsman for quite some time before he was made a freeman of the city. His advertisement in the *Pennsylvania Gazette* was deliberate, because it was a newspaper with the widest readership in this period, reaching through the Middle Colonies. His advertisement would be read in the various port communities and inform shipmasters of his services that would be available when they docked in New York. The only newspaper in New York at that time was *The New-York Gazette* established in 1725 and with a limited readership. It was not until 1733 that Peter Zenger began publishing another newspaper called *The New-York Weekly Journal.*

In 1730, at the time of Lamb's arrival, New York was still a small town clustered around the southern end of Manhattan Island, with a population of not more than seven or eight thousand residents. By the next quarter century the population had increased to only about twelve or thirteen thousand, of whom more than two thousand were black slaves. Historians have attributed this slow growth to several factors. First, New York was a frontier colony with Indians and the French threatening to the north and west and driving away the farmers. The morality of the city was comparable to that of later American frontier towns and outposts. In 1695 the Reverend John Miller, chaplain of the king's military force in the colony, as quoted in John F. Watson's *Annals and Occurrences of New York City and State in the Olden Time. . . .* (Philadelphia, 1846) reported to the Bishop of London that the clergy of the establishment were "of vicious life and conversation" and prejudicial to religion in general and to the Church of England in particular. He described the residents as drunkards and gamblers, noting that "this, joined to their profane, atheistical, and scoffing method of discourse, makes their company extremely uneasy to sober and religious men."

Another deterrent was the lack of self-government, for New York remained a royal colony for a long time, ruled by incompetent and often disreputable adventurers. The prevalence of slavery and of transported felons caused honest immigrants to seek settlement elsewhere, for all the vices of tyranny prevailed and made other colonies appear more attractive.[29]

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[29] *Burghers and Freemen,* Appendix, 483–84. Beverly McAnear, "The Place of the Freeman in Old New York," *New York History,* 21 (October 1940): 418–30.

"Overseer of the Fire Engine"

It was in the same year that Lamb became a freeman of the city that New York organized its first fire fighting force. At a meeting of the Common Council held on 18 November 1730, the aldermen were urged by influential citizens to purchase a fire engine and a type of sprinkler system which had been invented by Zachary Greyaal. Positive action was postponed, however, and again early in 1731 property owners asked the Council to provide better fire protection. Considerable interest had been generated by news of a remarkable new fire engine that had been invented and was being marketed by Richard Newsham in London. The Council was suitably impressed by accounts of this machine's performance and on 6 May 1731 resolved to purchase two of the engines from London. These arrived on 3 December, and were housed in separate sheds at the rear of the new City Hall.

At the time that the engines were purchased, the population of New York was given as 8,628 residents and there were 1,200 houses. The mayor and the aldermen and assistant aldermen were in charge at fires, and the general public was automatically required to do fire duty, no one over the age of twenty-one being exempt. After the disastrous experiences at a fire which occurred on 7 December, however, this arrangement was proven to be ineffective. The mayor and four aldermen were thereupon constituted a committee to appoint competent workmen to maintain the engines in good order and to operate them when necessary.[30]

The first "Overseer of Fire Engines" to be appointed was Peter Rutgers, a brewer and one of the assistant aldermen. He resigned after several months, and was succeeded by John Roosevelt, a merchant who served in the position until January 1735.[31]

Anthony Lamb was next appointed to the position, and received an annual salary of twelve pounds to be paid quarterly, with extra allowances "for several Materialls for fitting, Cleaning and Repairing the said Fire Engine." These "Materialls" included oil and tallow. The tallow was required for the flambeaux, tin containers packed with tallow and having bunched wicks on their upper surface. These were lighted and carried through the streets by the fire fighters to light the way for the fire engines and their operators.[32]

The first fire house in New York was constructed in the spring of 1736 and situated in the center of Broad Street between Wall Street and Exchange

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[30] [Augustine E. Costello], *Our Firemen. A History of the New York Fire Departments. Volunteer and Paid. . . .* (New York: Augustine E. Costello, 1887), pp. 23–29; [No author given], *Heritage of Flames. The Illustrated History of Early American Firefighting* (New York: Artisans Graphics Cooperation, 1977), 65–66, 78–82, 113–20.

[31] Costello, *Our Firemen,* 24.

[32] Costello, *Our Firemen,* 27; *Minutes of the Common Council of the City of New York 1675–1776* (New York: Dodd, Mead and Company, 1905), 4: 175, 188, 198, 206, 215, 232, 242, 248, 261, 282, 303, 319; Henry Asbury, *Ye Old Fire Laddies* (New York: Alfred A. Knopf, 1930), 31.

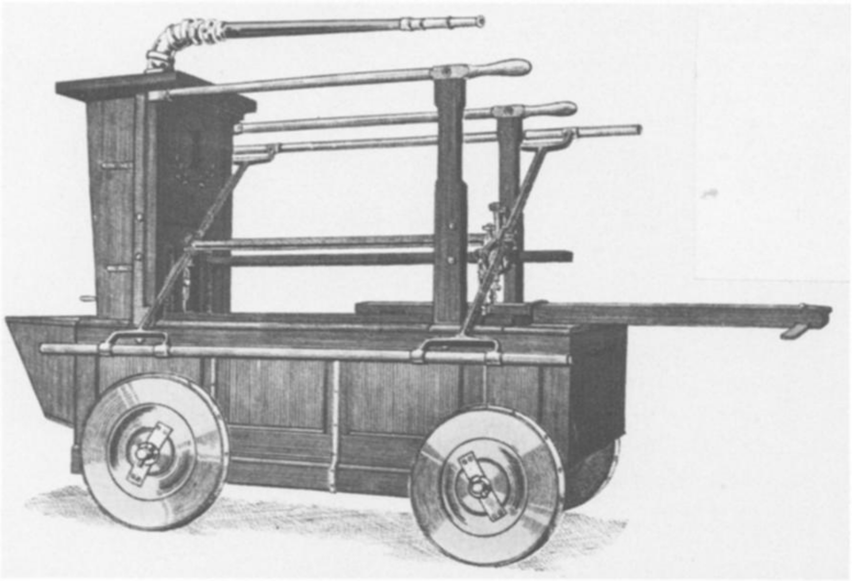


FIG. 12. The "Hayseed," the first fire engine of New York. A side-stoke gooseneck engine built by Richard Newsham of Cloth-Fair, London, it was imported in 1731. From an old print.

Place. At the end of the following year the General Assembly arranged for the formation of a volunteer fire department to consist of not more than forty-two "strong, able, discreet, honest and sober men."

Lamb continued to serve as overseer until the formation of "the Firemen of the City of New York," at which time he was succeeded by Jacobus

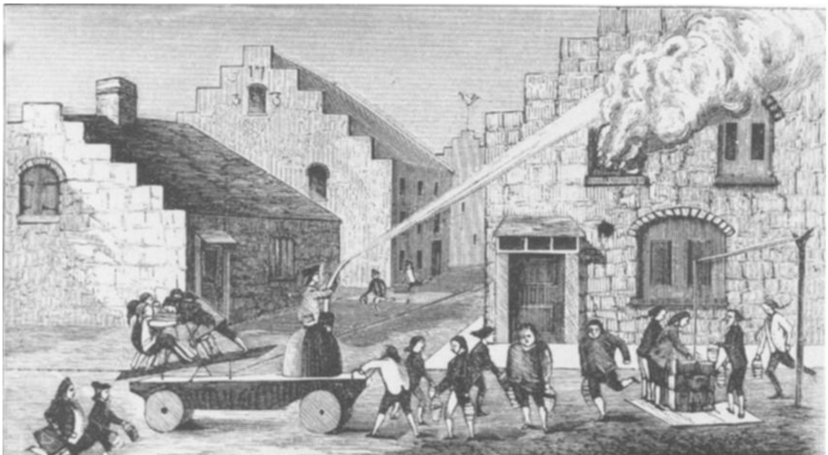
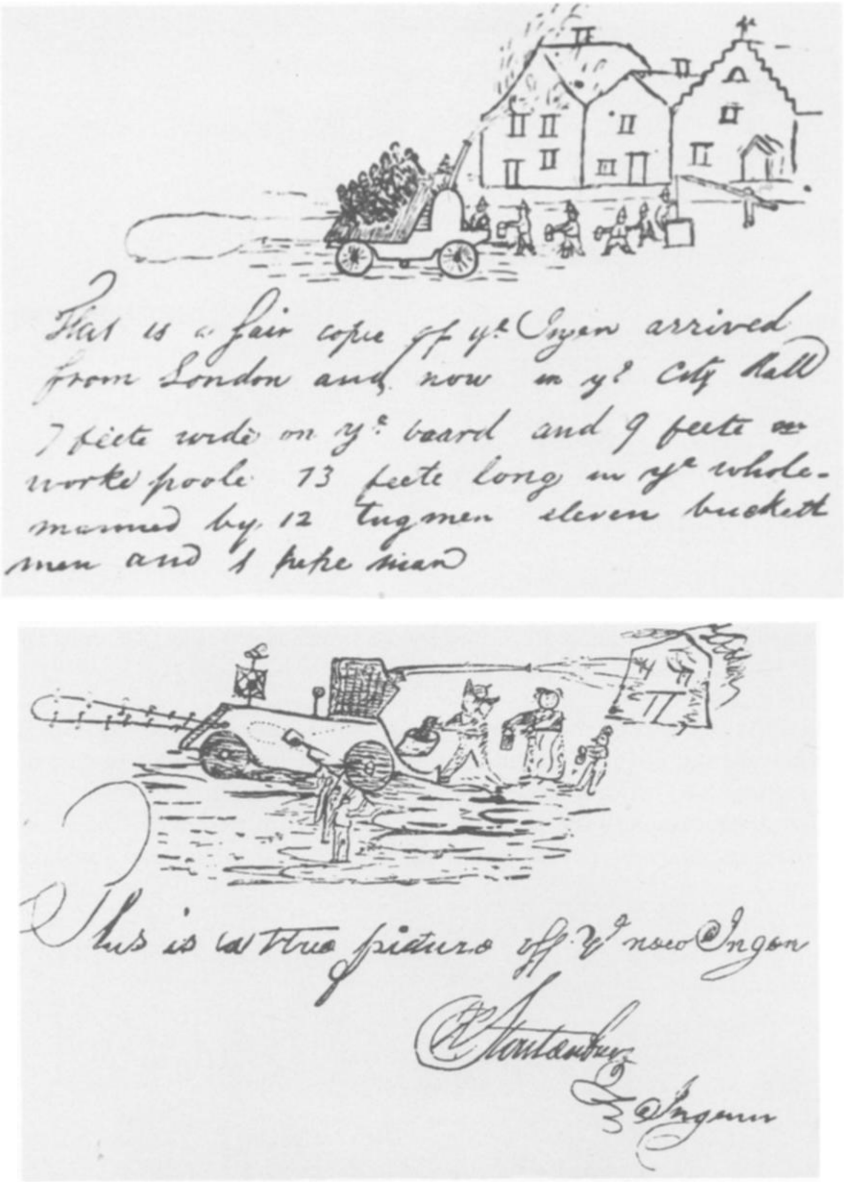


FIG. 13. "Firemen at Work." From a fire certificate of 1733. From *Our Firemen. A History of the New York Fire Departments . . .* by Augustine E. Costello (New York, 1887).



That is a fair copie off ye Ingen arrived from London and now in ye City hall 7 feete wide on ye board and 9 feete ye worke poole 13 feete long in ye whole. manned by 12 tugmen eleven buckett men and 1 pipe man

This is a true picture off ye new Ingen

J Stoutenburg

Ingener

FIG. 14a and b. Two pen sketches of New York's first fire engine made by Jacob Stoutenburgh, a gunsmith and one of the first firemen, appointed in 1738. From *Our Firemen. A History of the New York Fire Departments* . . . by Augustine E. Costello (New York, 1887).

Turk, a gunsmith, who retained the position for the next twenty-five years. Lamb's association with the fire department appears to have terminated at this time.[33]

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[33] Costello, *Our Firemen,* 24.

However, he continued to retain some association with the city government, for in 1749 the mayor was ordered by the City Council to issue a warrant to the City Treasurer to pay Lamb the sum of two pounds ten shillings for the salary due to Anthony Ham "late Messenger and Doorkeeper to the Board" of the Council for the period ending 14 July. Ham was Lamb's father-in-law.[34]

Family Affairs

Having successfully established himself as a freeman of the city with all the attendant privileges the designation accorded, and as a responsible and respectable member of his community with a thriving business, Lamb next turned his attention to domestic affairs. In about 1733 he was married to a young lady of Dutch descent, named Cornelia Ham, the daughter of Anthony and Elizabeth (Meyer) Ham, members of the Reformed Dutch Church of New York. Cornelia was eleven years her husband's junior. They became the parents of two daughters, not named, and a son, John, who was born on 1 January 1735. No records of the daughters have been found except that the younger one was born in 1758. Anthony and Cornelia Lamb served as witnesses or godparents at three baptisms in the Reformed Dutch Church. On 1 September 1734, Cornelia, wife of Anthony Lamb, and Pieter Meyer, perhaps a cousin, served as witnesses for the baptism of Pieter, son of Johannes and Elisabet [sic] Meyer. On 27 March 1752, Anthony Lamb and Annatje Meyer served as witnesses at the baptism of Annatje, daughter of Abraham and Elisabet (Meyer) de Foreest. On 25 January 1758, Anthony and Cornelia Lamb were witnesses at the baptism of Cornelia, daughter of Abraham and Elisabet de Foreest.

In 1738 when the militia was formed in New York, Lamb was prompt to respond, and enlisted as a private in "A Militia Company Under Y^{e} ^{Es}peciall Command" of Captain Paul Richards, a company consisting of seventy-three enlisted men and nine officers.

On 11 July 1757 Lamb served as a witness to the last will and testament of Hester Rynders, widow of Barent Rynders and the last surviving child of Jacob Leisler, a wealthy fur trader and merchant who in 1689 had become the insurrectionary leader of New York. Following the flight of Lieutenant Governor Francis Nicholson, Leisler assumed authority and administered the government with the same title. At the time that she drew her will, Hester Rynders was extremely wealthy and the owner of substantial real estate in the city.[35]

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[34] *Minutes of the Common Council,* 5: 394.

[35] Isaac Q. Leake, *Memoir of the Life and Times of General John Lamb An Officer of the Revolution, Who Commanded the Post at West Point at the Time of Arnold's Defection, and His Correspondence With Washington, Clinton, Patrick Henry, and Other Distinguished Men of His Time* (Albany, N.Y., 1857, repr. at Glendale, N.Y.: Benchmark Publishing Company, Inc. 1970), 9. *Baptisms From 1731 to 1800 in the Reformed Dutch Church, New York. Collections of the New York Genealogical and Biographical Society, Volume III* (New York: Printed for the Society, 1902), 35, 175, 224; E. B. O'Callaghan, the Documentary History of the State of New-York. Arranged Under the Direction of the Hon. Christopher Morgan, Secretary of

As Lamb prospered, he moved his shop to better locations to take advantage of the development of the harbor as shipping increased. With each change of location, Lamb also changed his shop designation. He was first situated on the New Dock adjacent to the Old Slip Market at the foot of King Street. The Old Slip extended from Hanover Square to the East River. His first shop designation was "At the Sign of the Compass and Quadrant" but by 1745 he moved further along the East River to Hunter's Key and changed his shop symbol to "At the Sign of the Quadrant and Surveying Compass," possibly as an indication that he produced instruments for land use as well as for navigation.[36]

Hunter's Quay, or Hunter's Key as it was sometimes written, had been constructed prior to 1730 and extended from the Old Slip to Wall Street. During these years that section of the waterfront was known as "Rotten Row." The owners of houses and lots fronting the river had long been complaining that the area had become "very Great nusances by Reason of the Filth that Floats there from the said River." It was probably the commanding aspect of the locality on the East River that led the residents to use the term "Rotten Row" to describe it, borrowing the name from London. There "Rotten Row" was a track reserved exclusively for horseriders in Hyde Park who paraded glossy steeds before admiring crowds and competed with exquisitely dressed women in elegant equipages drawn by highly bred horses. The track extended along the south side of the Serpentine from Hyde Park Corner to Alexander Gate. New York's Rotten Row was residential as well as commercial, and it is likely that Lamb lived in that area. The unpleasant conditions on the Key remained unresolved for the next several decades, until water-lots were granted on this part of the shore after 1767.[37]

By about 1750 Lamb again changed his shop symbol, although remaining at the same location. He now designated his shop "At Sir Isaac Newton's Head" and featured a portrait bust of the English scientist over his shop entrance and on his business stationery. He remained at this location for the remainder of his business career.

Lamb had no competition during the first decade and a half that he was in business but then the situation changed. In 1746 Charles Walpole, "Citizen of London," advertised the opening of his new shop at the corner of Wall Street near the Meal Market, a short distance from Lamb's establishment. Walpole sold mathematical instruments in silver or brass and repaired them as well.[38]

State (Albany: Weed, Parsons and Co., 1850), 4: 215–17. 35, 175, 224; *Abstracts of [New York] Wills. Collections of The New-York Historical Society* (New York: The New-York Historical Society, 1892–1908), 227–29. *Liber 24,* p. 9.

[36] Lamb's first shop designation was "At the Sign of the Compass and Quadrant" in 1731; by 1745 it was "At the Sign of the Quadrant and Surveying Compass;" and after about 1750 it was "At Sir Isaac Newton's Head," which it remained.

[37] Stokes, *The Iconography,* 4: 718; *Minutes of the Common Council, op. cit.,* vol. VI, pp. 247, 252, 426, vol. VII, pp. 13, 22–23, 25, 27, 32, 37–48, 79–81, 84–85, 94.

[38] *The New-York Evening Post,* May 26, 1746.

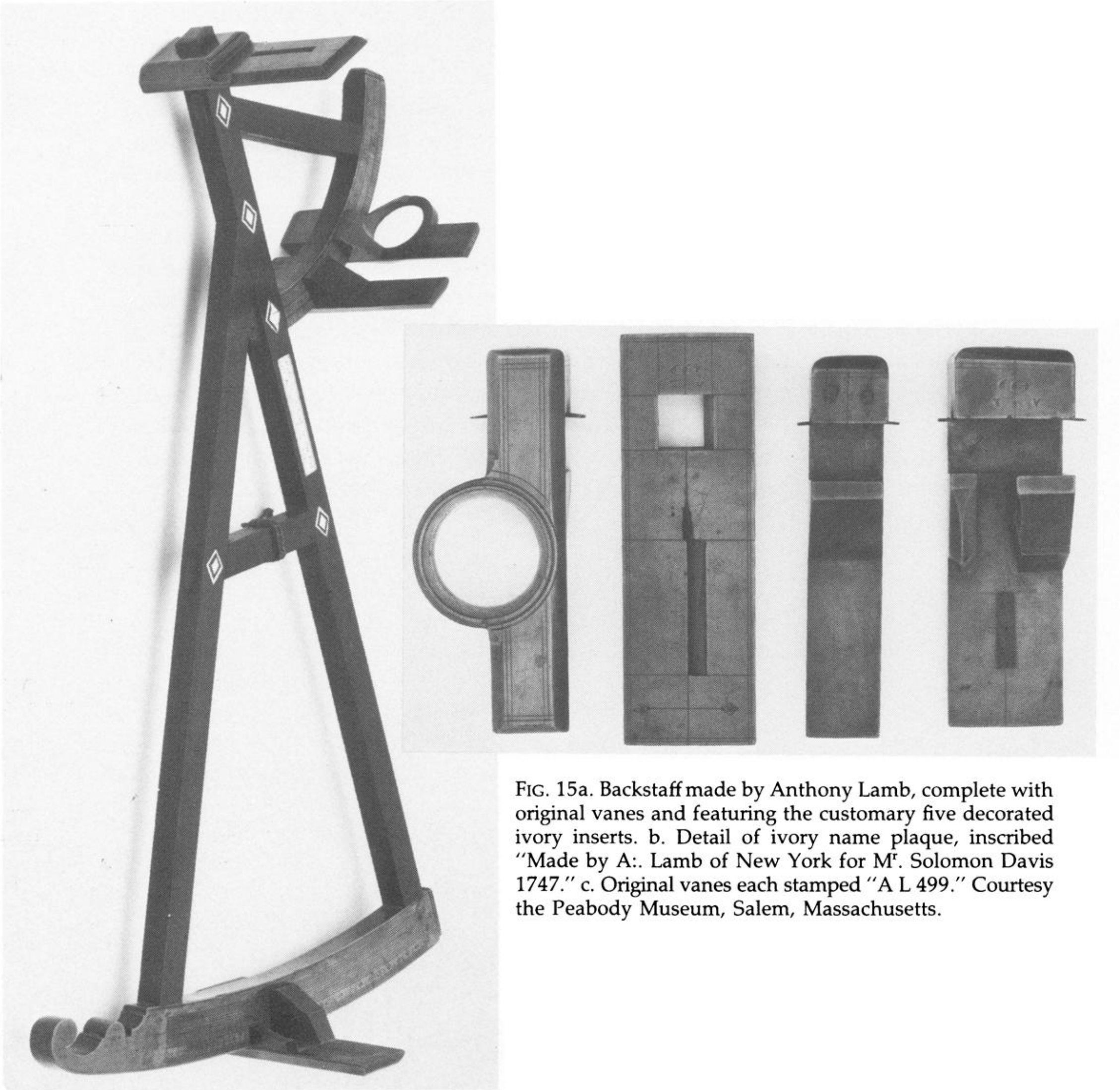
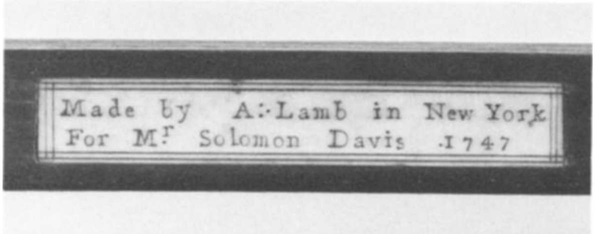


FIG. 15a. Backstaff made by Anthony Lamb, complete with original vanes and featuring the customary five decorated ivory inserts. b. Detail of ivory name plaque, inscribed "Made by A:. Lamb of New York for M^{r}. Solomon Davis 1747." c. Original vanes each stamped "A L 499." Courtesy the Peabody Museum, Salem, Massachusetts.



Almost a decade later, in 1754, the second of Lamb's competitors appeared on the scene. James Ham, who also described himself as a mathematical instrument maker, opened a shop in the house formerly owned by the Widow Ratsey near the Old-Dutch Church, where he made and sold instruments in wood, brass, and ivory. It is likely that Ham was one of Lamb's relatives by marriage, perhaps a nephew, who may have served an apprenticeship with him.[39]

Lamb's advertisements were few and far between, suggesting that his business advertised itself and that he resorted to the press only to inform the public of important new items or services he had added to his stock in trade. In July 1745 he noted that he had for sale "all sorts of Mathematical Instruments in Wood, Ivory or Brass, &c.," listing a wide variety including "Treble Rulers for ruling thick Books," small compasses "to fix on a Walking Stick, and lengthened to a suitable Height," protractors and optical instruments such as "Trunk Tellescopes . . . Walking Stick Spying Glasses" in addition to "Billiard or Trunk Balls" and numerous other items.[40]

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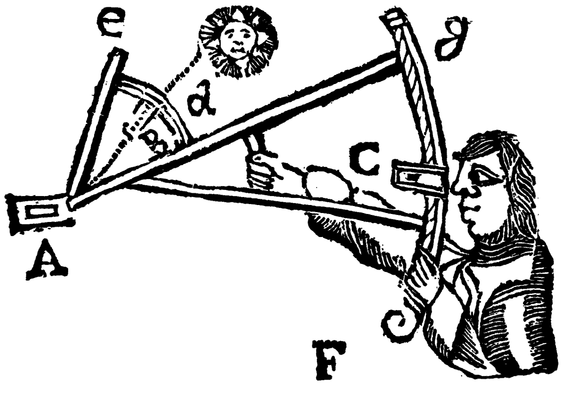
[39] *The New-York Mercury,* 27 May 1754.

[40] *The New-York Post-Boy,* 1 July 1745.



IV. THE INVENTION OF THE OCTANT

Priority of Invention

In 1749 Lamb advertised again to announce that he now had available a new navigational instrument, which he described as

> The late invented and most curious Instrument called an OCTANT, for taking the Latitude or other Altitudes at Sea, with all other Mathematical Instruments for Sea or Land, compleatly made by Anthony Lamb in New-York; where all persons may be supply'd with German Flutes, and sundrys of other small Work in Wood, Ivory, or Brass, and Books of Navigation; and a proper Direction given with every Octant. Ready money for curious hard Wood, Ivory, Tortois-Shell, or old Brass.[41]

Lamb's advertisement is the earliest known to have been published in the American colonies offering the "recently" invented octant. It was not in fact a new invention at the time of Lamb's advertisement for it had been invented in 1730 simultaneously by Thomas Godfrey in Philadelphia and by John Hadley in London. However, with each new invention, a few years would pass before it became commercially available, and more years still before it would be commonly adopted for use at sea. It is entirely likely that Lamb produced the very first octants made and used in the American colonies.

The priority of invention of the octant, an instrument made in the form of a graduated eighth of a circle for taking angular measurements at sea, has never been fully resolved. Thomas Godfrey, a Philadelphia window glazier and self-taught amateur of science, became interested in the inadequacies of existing navigational instruments while pursuing astronomical studies. After examining Davis's improved quadrant, he contemplated the possibility of using instead a semicircle graduated to 90° of which every 2 degrees were counted as one. Although theoretically feasible, the instrument proved to be too cumbersome to handle while observing great altitudes. He continued to experiment, with modifications of the mariner's bow and with improvement of the vanes of the backstaff. Finally in the summer of 1730 he made a major modification of the backstaff or Davis's quadrant which converted it into a new instrument which was called a "reflecting quadrant" and eventually the "octant." Borrowing a backstaff from a sea-going acquaintance, the mate of the sloop *Trueman*, Godfrey constructed five pieces of wood and mirrors which he temporarily attached to the backstaff's frame, and created a new instrument which was capable

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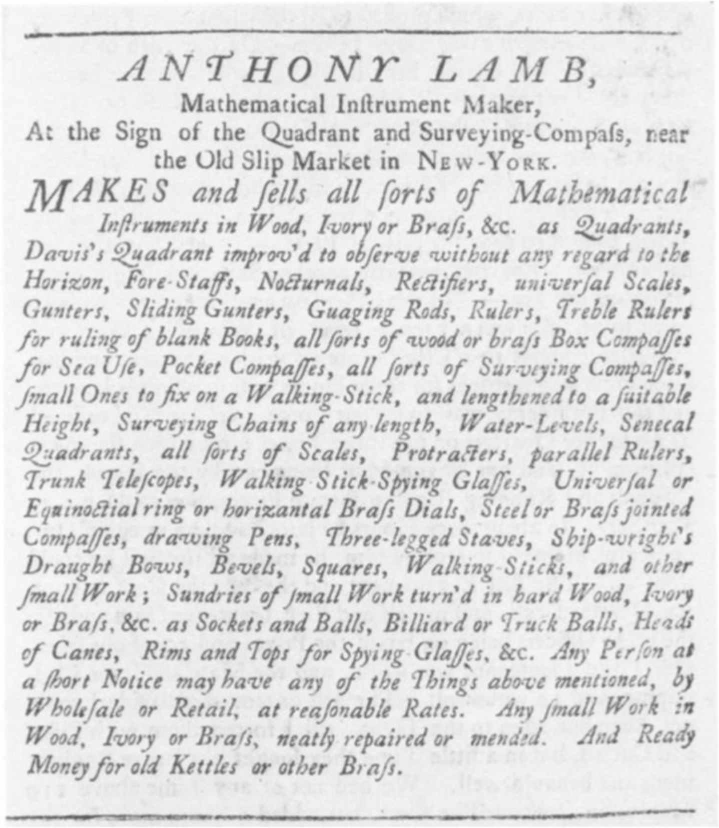
[41] *The New-York Post-Boy*, 23 January 1749.



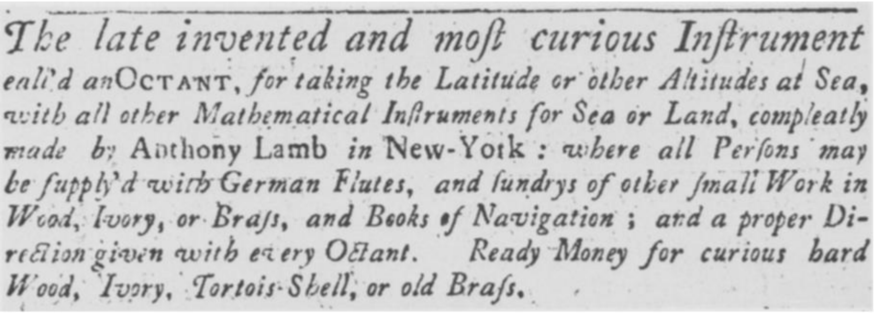
ANTHONY LAMB,

Mathematical Inſtrument Maker,

At the Sign of the Quadrant and Surveying-Compaſs, near the Old Slip Market in NEW-YORK.

MAKES and ſells all ſorts of Mathematical Inſtruments in Wood, Ivory or Braſs, &c. *as Quadrants, Davis's Quadrant improv'd to obſerve without any regard to the Horizon, Fore-Staffs, Nocturnals, Rectifiers, univerſal Scales, Gunters, Sliding Gunters, Guaging Rods, Rulers, Treble Rulers for ruling of blank Books, all ſorts of wood or braſs Box Compaſſes for Sea Uſe, Pocket Compaſſes, all ſorts of Surveying Compaſſes, ſmall Ones to fix on a Walking-Stick, and lengthened to a ſuitable Height, Surveying Chains of any length, Water-Levels, Senecal Quadrants, all ſorts of Scales, Protracters, parallel Rulers, Trunk Teleſcopes, Walking Stick-Spying Glaſſes, Univerſal or Equinoctial ring or horizantal Braſs Dials, Steel or Braſs jointed Compaſſes, drawing Pens, Three-legged Staves, Ship-wright's Draught Bows, Bevels, Squares, Walking-Sticks, and other ſmall Work; Sundries of ſmall Work turn'd in hard Wood, Ivory or Braſs,* &c. *as Sockets and Balls, Billiard or Truck Balls, Heads of Canes, Rims and Tops for Spying-Glaſſes,* &c. *Any Perſon at a ſhort Notice may have any of the Things above mentioned, by Wholeſale or Retail, at reaſonable Rates. Any ſmall Work in Wood, Ivory or Braſs, neatly repaired or mended. And Ready Money for old Kettles or other Braſs.*

FIG. 16. Lamb's advertisement for instruments in *The New-York Post-Boy,* 1 July 1745.



The late invented and moſt curious Inſtrument call'd an OCTANT, *for taking the Latitude or other Altitudes at Sea, with all other Mathematical Inſtruments for Sea or Land, compleatly made by* Anthony Lamb *in* New-York: *where all Perſons may be ſupply'd with German Flutes, and ſundrys of other ſmall Work in Wood, Ivory, or Braſs, and Books of Navigation; and a proper Direction given with every Octant. Ready Money for curious hard Wood, Ivory, Tortois-Shell, or old Braſs.*

FIG. 17. Lamb's advertisement for the octant, in *The New-York Gazette Reviv'd as The Weekly Post-Boy* for 23 January 1749. The difficulty experienced by makers of mathematical instruments in obtaining suitable materials in this period is reflected in Lamb's offer of ready money for them.

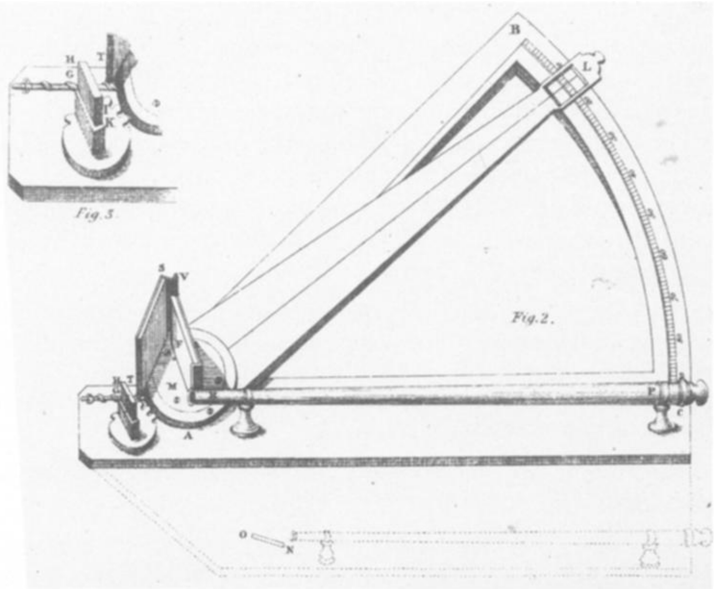


FIG. 18. Illustration of John Hadley's "new Instrument for taking Angles," which became known as the octant. From the *Philosophical Transactions of the Royal Society*, 37 (1733–1734): pl. XIII.

of making a back observation. The modified instrument was tested at sea on a voyage to the West Indies and later on one to St. John's in Newfoundland. The captain and first mate of the *Trueman* reported that they had tested it in November and December 1730 and again in February 1731 with successful results.

Godfrey then demonstrated the improved instrument to James Logan, the Pennsylvania statesman and member of the provincial council, and a man greatly interested in the sciences. Logan was so impressed with the invention and its potential as an aid to navigation that he determined to bring it to the attention of the Royal Society of London, with the intention of obtaining that body's acknowledgment of the invention. He was delayed in making a presentation until 1732, however, and in the interim a claim to the same invention had been made by John Hadley, vice-president of the Society, who had been experimenting with speculum grinding and reflecting telescopes.[42]

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[42] [No author given], "On the invention of what is called Hadley's Quadrant," *American Magazine and Monthly Chronicle*, vol. I, 1758, pp. 475–480, 527–34; American Philosophical Society, Manuscripts Division. "Nathan Spencer's Acct. of Godfrey, a farmer who owns the place that was Godfrey's. On the Invention of the Quadrant—commonly called Hadley's—(Extracted from the American Magazine for July 1758)." Submitted to Alexander Wilson, editor of Rees's *Cyclopaedia on* 8 September 1809 [sic]; "The Description of a new Instrument for taking Angles. By John Hadley, Esq.; Vice-Pr. R. S. communicated to the Society on 13 May 1731," *Philosophical Transactions of the Royal Society* No. 420, For August and September 1731, 37 (1733): 147–57, pls.; *A Description of a new Instrument, Invented by John Hadley,*

The Grandson's Memorial

The circumstances of Godfrey's invention, and Lamb's association with him, were the subject of a long "Memorial" written more than a century later by General Anthony Lamb, the grandson of the instrument maker. He had a distinguished career in New York's military and political affairs, and served as alderman for a number of years.

In January 1855 he wrote a long account of Godfrey's invention of the octant and the circumstances which led to the invention being credited instead to John Hadley. He then went on:

> I have often heard my Father say, that he was informed by his Father, who was a celebrated Mathematical Instrument maker of this City, that he was well acquainted with Thomas Godfrey. That he brought an account of his invention of a Sea Quadrant to him for the purpose of having some manufactured by him & that he did manufacture some . . .

After speaking of his grandfather's residence in New York as early as 1735, he added:

> it is reasonable to suppose that he had resided & carried on his business in this City several years before, at least as early as 1731, which was about the date that Godfrey applied to him to manufacture his quadrant, & about the time the handbill was issued.
>
> I will take leave to recapitulate some of the facts in the case.
>
> 1st Mr. Godfrey came to this City to get some quadrants made, according to his invention, probably early in 1731, as by his letter to the Royal Society dated the 20th of Nov. 1732 he says that 'about two years ago (which would be Nov. 1730) he made the invention of his quadrant' & he undoubtedly came to this City & had them manufactured soon after, say early in 1731.
>
> 2nd Godfrey's quadrant made, & advertised in this City as early, probably as 1731, & they were used by vessels sailing from Philadelphia to the West Indies, as stated by Mr. Logan in his letter to Dr. Halley dated May 25, 1732.
>
> 3rd Dr. Halley received this letter but never acknowledged the receipt of it. He never presented it to the Royal Society, & it was not known to them until Godfrey's letter to the Society, which was presented by Mr. Jones, when it was produced & read . . .
>
> From a fair interpretation of all these facts, I cannot admit of a doubt that the quadrant of Godfrey was manufactured for sale in this City, & that they were used by vessels sailing out of Philadelphia (his native place). . . .[43]

Esq: for taking the Latitude, or other Altitudes at Sea, with directions for its Use (London: Printed for the Author, 1734); [S. P. Rigaud], "History of Hadley's Quadrant," *The Nautical Magazine*, 1 (September 1832): 348–52; 2 (November 1833): 654–62; 3 (April 1834): 201–10, (May 1834): 286–92, (June 1834): 339–45; Thomas Coulson, "Godfrey's Invention of the Reflecting Quadrant," *Journal of the Franklin Institute*, 266, No. 5 (November 1958): 327–37; Ann Martin, "Young Tom Godfrey and His 'Sextant'," *The American Neptune*, (April 1975): 111–17; Bedini, *Thinkers*, 118–23, 146–47.

[43] The New-York Historical Society, Manuscripts Division, *The Papers of John Lamb*. Communication to the Society by General Anthony Lamb, dated 5 January 1855, presented and read by the President at the stated meeting on 1 May 1855.

The account of Godfrey's octant in Lamb's grandson's memorial of 1855, although written so long after the fact, recounts family tradition of considerable importance. Its review of incidents relating to the invention of the instrument passed down to the grandson from Anthony Lamb himself through his father, confirms the suspected association between Lamb and Godfrey prior to his arrival in New York. Inasmuch as there were no makers of mathematical instruments in Philadelphia at the time that Godfrey invented his reflecting quadrant, it would have been logical for him to seek out his former acquaintance even though at a considerable distance.

In his account Lamb's grandson quoted from the letter that James Logan had sent to Edmund Halley, then president of the Royal Society, in which Logan described Godfrey's career and how he had taught himself in mathematics, astronomy and Latin. He went on to relate that he had developed

> an instrument for taking the distances of stars, by reflecting speculums, which he believes might be of service at sea; and not long after he showed me a common sea quadrant, to which he had fitted two pieces of looking glass, in such a manner as brought two Stars to almost any distance, to coincide the one by direct and the other by reflected ray so that the eye could take them both together as joined in one, while a movable label or index on the graduated arch marked exactly half the distance . . . Some vessels that sail from here to the West Indies, have got some of them as well as they could be made here, & have found them to be of so great advantage in their facility,—& ready use in these Southern latitudes, that they reject all others.[44]

Since Logan had received no acknowledgment of his letter to Halley, on 27 November 1732, in the same year Godfrey wrote to the Royal Society on his own behalf. According to the Society's minutes, the letter was laid before the Society on 31 January 1733, and mention was made at the time also of Logan's earlier letter.[45] There has been much speculation concerning the reasons that Halley withheld the letter for such a long period of time and who may have seen it in the interim.[46] John Hadley, then vice president of the Society, announced his invention of the reflecting quadrant, later called the octant, to the Society on 13 May 1731, and first demonstrated the instrument to the Society on the following May 27. He obtained a patent for it on 22 November 1734.[47] The priority of invention is still contested between adherents of Hadley and Godfrey, but it may have been a case of simultaneous invention. The octant revolutionized navigation until it was finally superseded by the sextant, and remains one of the outstanding achievements of one of the colonial American "little men of science."

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[44] Royal Society of London, *Correspondence.* Letter from James Logan to Edmund Halley, 25 March 1728 (Ref. No. L6.59).

[45] Royal Society of London, *Correspondence.* "Letter from Mr. Thomas Godfrey to the Royal Society, giving an Account of an Instrument (said to be of his invention) for taking Altitudes at Sea &c. by a Double Reflection," 9 November 1723 (Ref. No. LBC. 20. 415–19).

[46] James Logan, "An Account of Mr. T. Godfrey's Improvement of Davis' Quadrant, transferred to the Mariner's Bow, communicated to the Royal Society by Mr. J. Logan," *Philosophical Transactions of the Royal Society,* 38 (1735): 441–50.

[47] [John Hadley], "The Description of a new Instrument for taking Angles. By John Hadley, Esq: Vice-Pr. R. S. communicated to the Society on May 13, 1731," *Philosophical Transactions of the Royal Society,* 38 (1733): 147–57, pls. (Abridged series, 7: 486–91).

Inevitably Alderman Lamb's memorial revives the question as to when, where and how Lamb and Godfrey may have first met. Such a meeting must have occurred during the "missing" years prior to 1730, and it seems ever more likely that Lamb spent them in Philadelphia in the employment of a craftsman of that city.

Godfrey's first experiment with the reflecting quadrant was achieved by the addition of five pieces of wood and mirrors attached to an ordinary backstaff. It is not clear whether these were constructed by Godfrey or whether he had them made for him by others, perhaps by Lamb. In the collections of the Franklin Institute in Philadelphia is an eighteenth century backstaff which bears a paper label with an interesting handwritten inscription proposing a relationship to Godfrey's first attempt to produce the new instrument:

> Godfrey's Quadrant (original model).
> Deposited in the Franklin Inst.
> By
> Dr. Charles M. Wether . . .
> 206 Cherry St.

The same inscription written in pencil on the major arc is barely legible. The ivory name plaque is missing so that the identity of the maker is not known. However, three of the five decorated ivory lozenge-shaped inserts, which were a characteristic of many of the backstaffs produced by Lamb, are still in place, suggesting the possibility that the inscription may have some basis in fact. The donor was Dr. Charles Mayer Wetherill, the noted chemist who made important contributions in his field. The gift was made prior to 1856, at which time he left Philadelphia.[48]

Lamb's next advertisement, which appeared in 1753, four years later, is of particular significance for it is the first public mention made in the press of Godfrey's invention:

> FOLIATING, or QUICK-SILVERING all sorts of LOOKING-GLASSES and SCONCES, neatly done with care and expedition, by ANTHONY LAMB, mathematical instrument maker, living on Hunter's Key; where may be had Godfry's new invented quadrant, for taking the lattitude or other altitudes at sea, hydrometers for trying the exact strength of spirits, large surveying instruments in a more curious manner than usual; which may be used in any weather without exception, small

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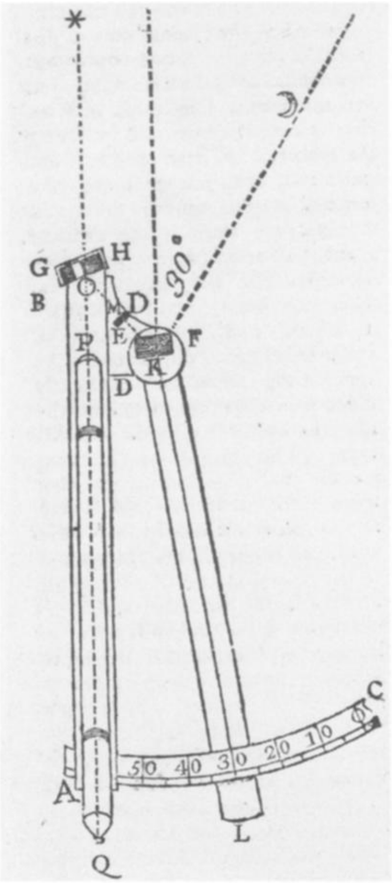
[48] Malone, *Dictionary*, "Charles Mayer Wetherill," 10, pt 2, p. 22; Edgar Fahs Smith, "Charles Mayer Wetherill, 1825–1871," *Journal of Chemical Education*, 6, No. 6 (June 1929): 1076 *et seq*. The backstaff was discovered in recent years stored in a recess of the library of the Franklin Institute. No documentation or accession records for the instrument are on file.



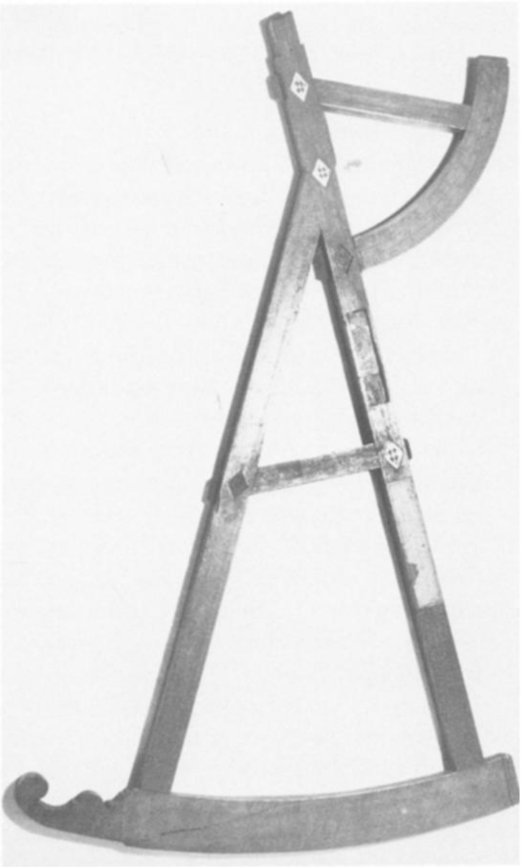
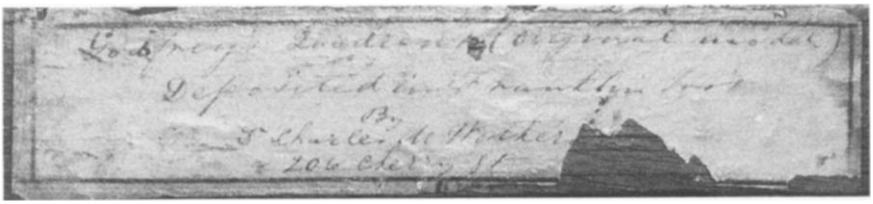


FIG. 19. Earliest known illustration of Godfrey's reflecting quadrant. From *The American Magazine and Monthly Chronicle,* 1 (1758): 478.

FIG. 20. Backstaff, American, eighteenth century, unsigned and undated, but possibly made by Anthony Lamb. To be noted are the decorated lozenge-shaped ivory inserts at the intersections, a characteristic of backstaffs made by Lamb. Courtesy the Franklin Institute.



Godfrey's Quadrant (Original model)
Deposited in F Franklin Inst
By
Dr Charles M Wether
206 Cherry St

FIG. 21. Detail of a paper label on the unsigned backstaff stating that it is "Godfrey's Quadrant (original model). Deposited in the Franklin Institute by Dr. Charles M. Wether . . . , 206 Cherry Street . . ." Courtesy the Franklin Institute.

ditto which may be fixed on the head of a walking stick, and lengthened to a commodious height, gauging instruments as now in use, according to an act of assembly with all other mathematical instruments for sea or land, by wholesale or retail, at reasonable rates.[49]

Lamb's advertisements of 1749 and 1753 arouse several questions. Was "the late invented and most curious Instrument called an OCTANT" which he advertised in 1749 identical with "Godfry's new invented quadrant" that he made and sold four years later? Although they were based on the same principle and performed the same function, there were distinct variations in appearance between the two instruments in their earliest forms. Also, during the eighteenth century, the octant was variously known as "Hadley's quadrant," and more simply as a "quadrant" and a "reflecting quadrant." The distinction made by Lamb in his advertisements tends to confirm the fact that he produced both versions as specified. He would have received requests from shipmasters for Hadley's octant which was the better known version among navigators, and it is clearly specified that he produced Godfrey's version as well.

On the basis of the documentary evidence of Lamb's grandson, he made Godfrey's reflecting quadrant for the inventor in about 1731 but it is not clear whether he then only produced examples for Godfrey and not for sale in his own shop. Yet he first advertised the instrument more than two decades later. The answer may lie in the fact that Godfrey died in 1749 and that for some reason Lamb felt free only then to market his instrument. The reason that he first made and sold Hadley's quadrant or octant in 1749 may have been because Hadley's patent, obtained in 1734, had expired at that time. As well as can be determined, Lamb was the first American maker to produce Hadley's octant and Godfrey's reflecting quadrant, and perhaps the only maker to make and sell the latter.

The Handbill

The advertisement to which Alderman Lamb referred in his memorial is a unique copy which he donated to The New-York Historical Society in 1855. The handbill is undated, but was produced between 1750 and 1755, when Lamb had again changed the name of his shop to "At Sir Isaac Newton's Head":

ANTHONY LAMB
Mathematical Instrument-maker
at S^{r} Isaac Newton's Head, New York

Makes and sells all sorts of Mathematical Instruments for Sea and Land, in Silver, Brass, Ivory, or Wood, with a great variety of other curious Work in the neatest and best manner wholesale or retail at reasonable rates. Viz M^{r}. Godfrey's new Sea Quadrants, Davis's d$^{\circ}$, Crosstaffs, Nocturnals, Rectifyers, Universal, Gunters,

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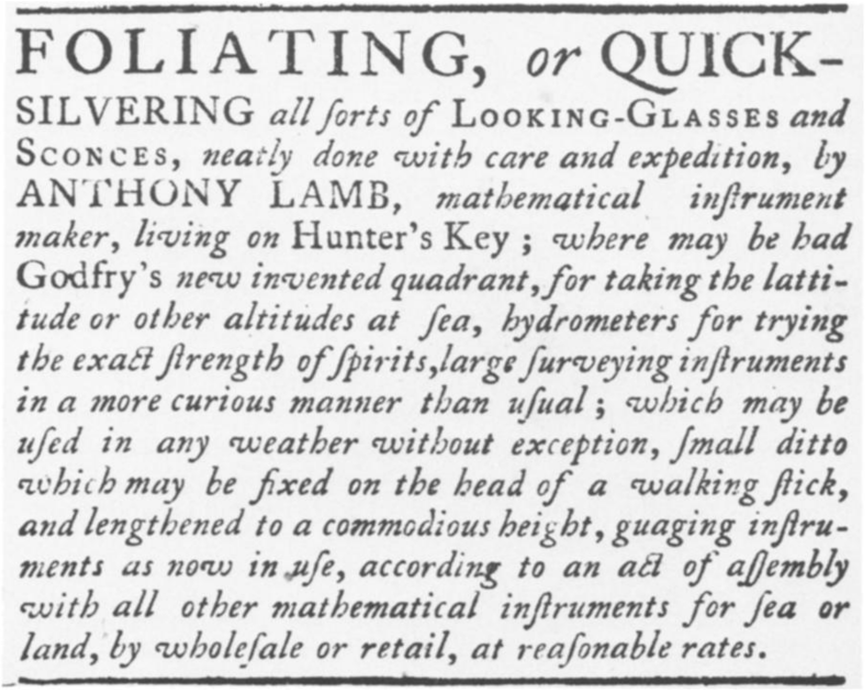
[49] *The New York Mercury,* 11 June 1753.

Sliding d°. & Surveying Scales, plain Dividers, d°. with Points, Surveying Chains, Cases of Instruments, Horizontal & Ring Dials, Amplitude, Meridian, Hanging & Pocket Compasses, all sorts of Surveying Compasses, with Agate capt Needles, all sorts of Instruments for Gunnery & Fortification, Sectors, Protractors, Sockets & Balls, three legged Staffs, Water Levels, Callipers, Sliding Rules & Rods for gauging. Back-gammon-Tables, Rulers for Cutting of Parchment, Treble d°. for ruling Blank Books, Shipwrights Draught Bows, Trunk Tellescopes, Walking Stick d°., Ivory leav'd Table Books, German Flutes, Seal Handles, Walking Sticks, Billiard d°., & Balls, Hydrometers for trying of Rum, Quicksilvering of Looking Glasses, & Sconces, &c., &c., &c. Likewise Copper plate Blanks, as Bills of Lading, Bonds, Indentures, Bills of Sale, Acts of Parliament, Power of Attorney, Wills and Powers, Parchment & Paper Blanks for the Law, with a variety of Prints, also Artificial Teeth.[50]

The fact that Lamb also made and sold artificial teeth in addition to the wide range of scientific instruments and stationery supplies is of particular interest, because it appears to have been the earliest known advertisement



FOLIATING, *or* QUICK-SILVERING *all ſorts of* LOOKING-GLASSES *and* SCONCES, *neatly done with care and expedition, by* ANTHONY LAMB, *mathematical inſtrument maker, living on* Hunter's Key ; *where may be had* Godfry's *new invented quadrant, for taking the lattitude or other altitudes at ſea, hydrometers for trying the exact ſtrength of ſpirits, large ſurveying inſtruments in a more curious manner than uſual ; which may be uſed in any weather without exception, ſmall ditto which may be fixed on the head of a walking ſtick, and lengthened to a commodious height, guaging inſtruments as now in uſe, according to an act of aſſembly with all other mathematical inſtruments for ſea or land, by wholeſale or retail, at reaſonable rates.*

FIG. 22. Lamb's advertisement for the reflecting quadrant invented by Thomas Godfrey of Philadelphia, in *The New-York Mercury* for 11 June 1753. This is believed to be the first public announcement of the invention, and Lamb to have been the first to produce it commercially.

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[50] The New-York Historical Society, Manuscripts Division, Handbill of Anthony Lamb, ca. 1751–1755.

in New York for false teeth. Two "tooth-drawers" were active in New York prior to mid-century, but it was not until at least 1766 that the first dental practitioner advertised the production and sale of false teeth. This was John Baker, who first practiced in Boston before establishing himself in New York in 1768. Lamb's skill in working ivory for his scales and other instruments and undoubtedly also for his "curious other Work," enabled him to produce artificial teeth in this material as well.[51]

The variety and range of Lamb's instruments is impressive, and covered the needs of all the mathematical practitioners.

Henry Dawkins, Engraver

Lamb's handbill bore the name of H. Dawkins as the engraver, and was among the first examples of the work he executed in the colonies. The copperplate engraving features a rococo framework of C-scrolls, foliation and scallops enclosing the text divided into two cartouches. The upper one includes a portrait of a bewigged Isaac Newton, the symbol of Lamb's shop, and the lower cartouche encloses the text. On either side of the upper cartouche a bird with a sprig in its beak flying over a basket of flowers is featured. The combination of motifs and decorative details are found on other handbills and trade cards of English craftsmen including makers of mathematical instruments. This suggests that prototypes or standard forms may have existed, from which Dawkins, trained as an engraver in London, may have copied to produce Lamb's handbill.

Dawkins emigrated from London to New York shortly after 1750. He had been trained as "an ornamenter of buttons, and other metallic substances," and it was also noted that "he worked at anything that offered, suiting himself to the poverty of the arts at the time." [52]

Lamb added Dawkins to the staff of his shop in about 1751. He provided the engraver with room in his own home and board in addition to a salary. On the basis of the range of instruments and other items produced by Lamb, there was considerable work for Dawkins in the shop. It was during this period that he engraved the earliest known dated example of his work, a book-plate for John Burnet, a lawyer.[53] He was ambitious and restless,

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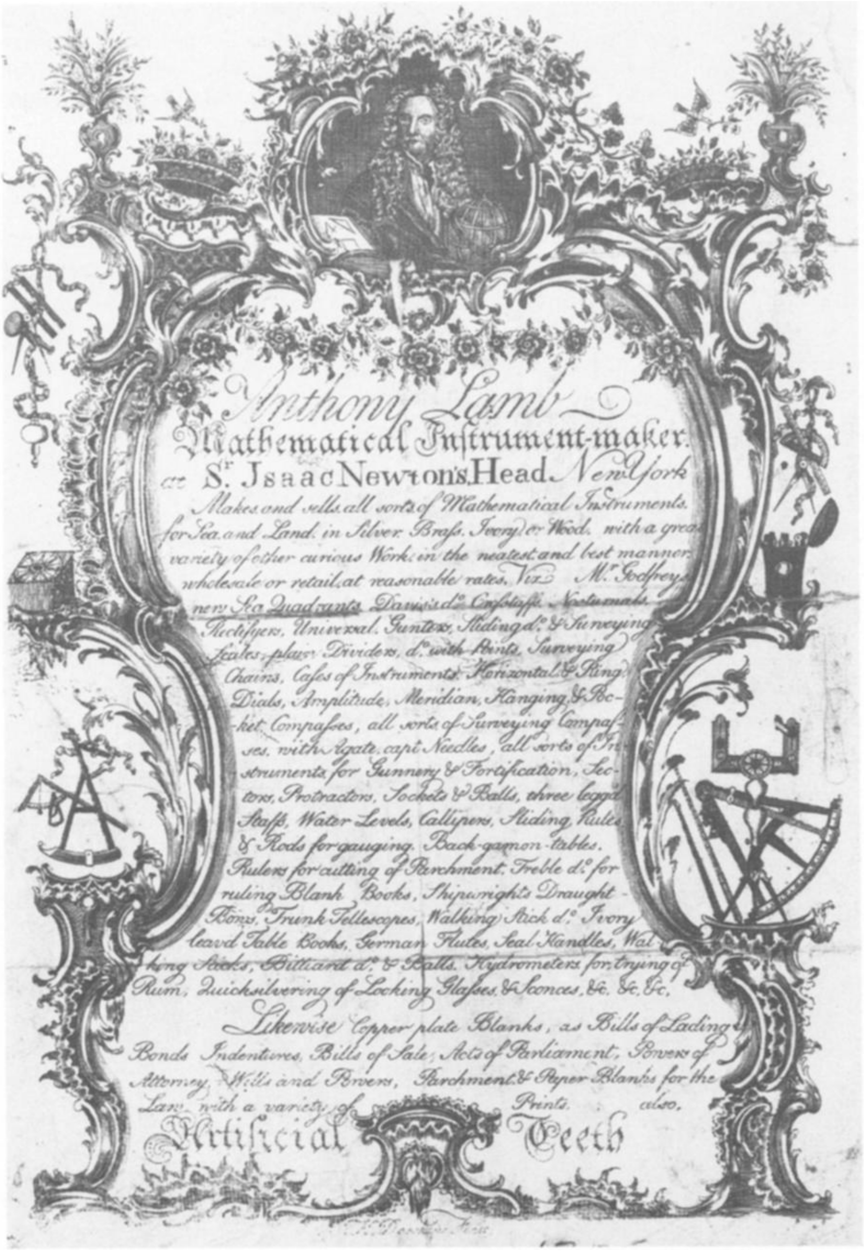
[51] Bernhard Wolf Weinberger, *An Introduction to the History of Dentistry in America* (St. Louis, Mo.: The C. V. Mosby Company, 1948), 2: 14–23; Bernhard Wolf Weinberger, "The First Hundred Years of American Dentistry," *Dental Items of Interest*, 56, (1934): 852–72; John G. Ambler, "History of the Manufacture of Artificial Teeth," *Transactions of the Dental Society of the State of New York*, 1869: 52–58; The New-York Historical Society, Manuscripts Division, Isaac Greenwood, "Early Dentistry in America," unpublished manuscript; Edward C. Kirk, "Pioneer Dentistry in New York: An Historical Study," *The Dental Cosmos*, 48, No. 10 (October 1906): 981–97.

[52] Wilford P. Cole, "Henry Dawkins, Engraver." Thesis submitted for the degree of Master of Arts, University of Delaware, June 1966, pp. 9–13, 110–13, 224; Stephen Decatur, "The Conflicting History of Henry Dawkins, Engraver," *American Collector*, 7, No. 12 (January 1939): 6–7; David McNeely Stauffer, *American Engravers Upon Copper and Steel* (New York: The Grolier Club, 1907), Part I, pp. 60–62.

[53] Decatur, "The Conflicting History" 7.



Anthony Lamb
Mathematical Inſtrument-maker.
at S^r. Isaac Newton's Head. New York
Makes and sells all sorts of Mathematical Instruments
for Sea and Land in Silver Braſs Ivory & Wood. with a great
variety of other curious Work. in the neatest and best manner
wholesale or retail, at reasonable rates. Viz. M^r. Godfrey's
new Sea Quadrants Davis's d^o. Croſstaffs Nocturnals.
Rectifyers, Universal Gunters, Sliding d^o. & Surveying
ſcales, plain Dividers, d^o. with Points, Surveying
Chains, Caſes of Instruments Horizontal & Ring
Dials, Amplitude, Meridian, Hanging & Poc-
-ket Compaſses, all sorts of Surveying Compaſ-
-ses, with Agate capt Needles, all sorts of In-
-struments for Gunnery & Fortification, Sec-
-tors, Protractors, Sockets & Balls, three legg'd
Staffs, Water Levels, Callipers, Sliding Rules
& Rods for gauging. Back-gamon-tables.
Rulers for cutting of Parchment. Treble d^o. for
ruling Blank Books, Shipwrights Draught
Bows, Trunk Tellescopes, Walking Stick d^o. Ivory
leav'd Table Books, German Flutes, Seal Handles, Wal-
-king Sticks, Billiard d^o. & Balls. Hydrometers for trying of
Rum, Quicksilvering of Looking Glaſses & Sconces, &c. &c. &c.
Likewise Copper plate Blanks, as Bills of Lading
Bonds Indentures, Bills of Sale, Acts of Parliament, Powers of
Attorney, Wills and Powers, Parchment & Paper Blanks for the
Law with a variety of Prints. also,
Artiſicial Teeth

FIG. 23. Handbill of Anthony Lamb, ca. 1751–1755. Engraved by Henry Dawkins. Unique copy. Courtesy The New-York Historical Society.

and by late 1755 his work with Lamb terminated. He then attempted to establish his own business in engraving, which he described in an advertisement in *The New-York Mercury:*

> HENRY DAWKINS, engraver, who lately lived with Mr. Anthony Lamb, has now set up his business in the shop late Mr. Paiba's, opposite the Merchants Coffee-House, in New York, where he engraves all sorts of mettals. Gentlemen that will favour him with their work, may depend on having it done in the best manner, with expedition, and on the most reasonable terms.[54]

Dawkins continued to work in New York for a time but it may not have been sufficiently lucrative, for he moved to Philadelphia where he produced work for the American Philosophical Society, engraved several important maps of the region, and engraved Indian testimonials for Sir William Johnson, the British superintendent of Indian affairs in the Mohawk Valley.

In about 1774 Dawkins returned to New York where a counterfeiting scheme landed him in jail for a time. After release he worked for the state for which he designed the coat-of-arms.[55]

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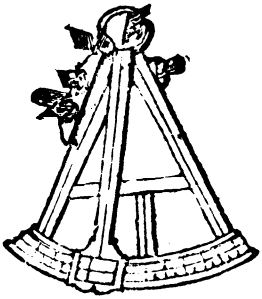
[54] *The New-York Mercury,* 20 October 1755 and subsequent issues.

[55] John Broome, "The Counterfeiting Adventures of Henry Dawkins," *American Notes and Queries,* Notes, March 1950, pp. 179–84; Decatur, "The Conflicting History" 6–7; Kenneth Scott, *Counterfeiting in Colonial New York* (New York: The American Numismatic Society, 1953), 193–95, 203–05.



V. THE MID-CENTURY YEARS

Period of Prosperity

By the time Lamb reached middle age, he had achieved a period of prosperity and achievement and undoubtedly of contentment. Nothing is known about his daughters. However, his son was serving an apprenticeship in his father's shop. Lamb's position as the foremost maker of mathematical instruments in New York and one of the best known in the colonies was well established.

Some indication of his wordly status in this period may possibly be found in the fact that he owned slaves, one of whom had run away from him. In the spring of 1753 Lamb advertised:

> Run away, from the subscriber, in New-York, on Friday the 6th Instant, a well-set negro wench, named Jane. Had on when she went away, a green waistcoat and blue pettycoat; and is supposed to be harbour'd by some of her own colour in or about this City. Whoever takes up and secures the said wench, so that her master may have her again, shall receive Twenty Shillings reward, and all reasonable charges by ANTHONY LAMB.
>
> N.B. Said Wench lately belonged to John Burling, who gave her a note or pass, to look for a master, which she may possibly make use of now, the better to go unmolested.

This notice is believed to be the earliest advertisement in New York newspapers for a runaway slave to be illustrated with a slave figure.[56]

Records of Lamb's business are quite as scarce as surviving examples of his instruments, but the several that have come to light are important because they provide illuminating information on range of his work in not only making instruments but repairing them, and of his clientele.

One such record is found in the account book of the firm of New York merchants, the brothers Jonathan and John Holmes. In an entry dated 10 May 1750 in account with their father, "M^{r}. Jonathan Holmes, Jun^{r}. in y^{e} Jersey's," who lived in Freehold is noted "To Altering Surveying Compass as per Anthony Lamb's Acct . . . £ 2. 1. –." [57]

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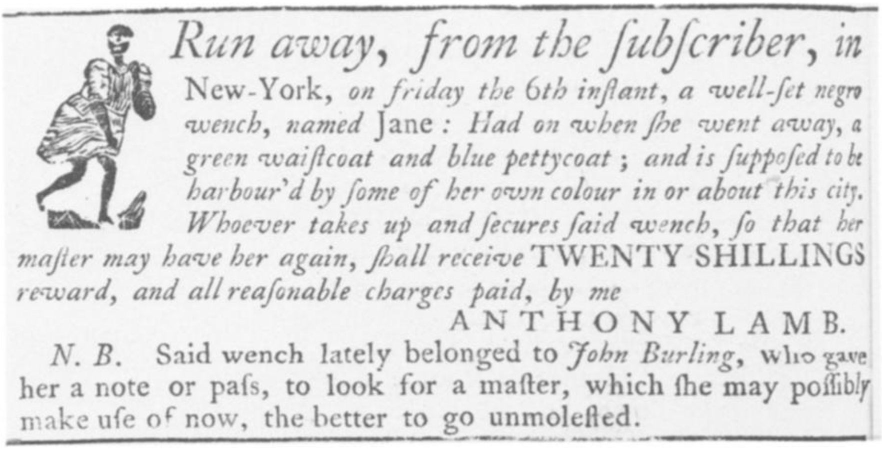
[56] *The New-York Mercury,* 30 April 1753. John Burling was a noted New York cabinet maker. [Rita Susswein Gottesman], *The Arts and Crafts in New York 1726–1776.* Collections of the New-York Historical Society For the Year 1936 (New York: For The New-York Historical Society, 1938), 343, fn. 1.

[57] The Henry Francis du Pont Winterthur Museum, *Downs Manuscript Collection.* Ms. 71 × 71, *Account Book,* Ledger A of Jonathan Holmes for 1749–1754, page 10.

Jonathan and John Holmes were two of eleven children of Jonathan Holmes, Junior, a yeoman of Freehold, New Jersey. He was given the designation of "Junior" to distinguish



Run away, from the ſubſcriber, in New-York, *on friday the 6th inſtant, a well-ſet negro wench, named* Jane: *Had on when ſhe went away, a green waiſtcoat and blue pettycoat; and is ſuppoſed to be harbour'd by ſome of her own colour in or about this city. Whoever takes up and ſecures ſaid wench, ſo that her maſter may have her again, ſhall receive* TWENTY SHILLINGS *reward, and all reaſonable charges paid, by me*

ANTHONY LAMB.

N. B. Said wench lately belonged to *John Burling*, who gave her a note or paſs, to look for a maſter, which ſhe may poſſibly make uſe of now, the better to go unmoleſted.

FIG. 24. Lamb's advertisement for a runaway slave. From *The New-York Mercury* for 30 April 1753.

An invoice made out in Lamb's hand on 4 July 1755 to an unidentified client itemized a number of instruments which he made and sold, including

> a Pair of Brass Callipers, an Instrument for Taking of Angles w.th 4 Sights, a Large Protractor, a Pocket Compass, 12 Large Brass Rings Soldered, a pair of Dividers & mending a Drawing pen, Engraving a Brass Ruler and a Brass Plum[bob], 2 [Pairs?] of Box Wood for Drawing Parrallel Lines,

at a total cost of £ 7. 1. 0.[58]

Surviving also is Lamb's receipted invoice to Donis Candy, master of the sloop *Dolphin,* dated 1 October 1760 "To Repairing and Touching two compasses" for a total cost of 6 s. 6 d. In the upper left corner of the invoice is an engraving of a portrait bust of Sir Isaac Newton which became the symbol of Lamb's shop from about 1751.[59]

"A. Lamb & Son"

Young John Lamb completed the period of apprenticeship with his father by the time he had reached the age of twenty, possibly a shorter period than the customary seven years. Eager to establish his own identity, he had become particularly interested in engraving and in the decorative

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him from an uncle, Jonathan Holmes, Senior, and a cousin, Jonathan Holmes, Minor. In 1762 John Holmes was living at Forked River, New Jersey, where he also owned a mill. His house was raided during the American Revolution. John E. Stillwell, *Historical and Genealogical Miscellany: Early Settlers of New Jersey and Their Decendents* (New York, 1914), 3: 317–18, 336–37. Courtesy Gayle L. Chandler, Winterthur Museum.

[58] The Henry Francis du Pont Winterthur Museum, *Downs Manuscript Collection.* Ms. 82 × 262, Account of "Work Done by Anthony Lamb in New York, July 4, 1755."

[59] The New-York Historical Society, Manuscripts Division. Invoice of Anthony Lamb in account with Donis Candy, master of the sloop *Dolphin,* 1 October 1760 (NYC Misc. Box 8, #13).

aspects of his father's craft, and for a time he considered making it his career.[60]

Anxious to establish a home of his own, he married Catherine Jandine, a young lady from a New York family of Huguenot descent, on 13 November 1755.[61]

Possibly as a means to keep his son with him in his business and to overcome his restlessness, Anthony Lamb made him a partner in his business, and changed the firm name to "A. Lamb and Son." A single instrument produced in the period of the partnership has survived, a plain surveying compass of brass.

John continued to work as his father's partner for the next five years, but seemingly with reservations. Ever since his marriage he had longed to establish himself in a business of his own which would elevate him from the status of mechanic to that of a gentleman, comparable to the station of his wife's family. He was extremely ambitious, and his father's criminal past, though long forgiven, had not been forgotten.[62]

John Lamb's first attempt at independence was reflected in an advertisement which appeared in the press on 15 March 1756, in which he advised that the public could purchase, "ENGRAVING in gold, silver, copper and other metals, by JOHN LAMB, at Sir Isaac Newton's Head, on Hunter's Key, New-York." [63]

Anthony and John Lamb continued to work together in the same shop for four more years, while John contemplated a more suitable career. Having spent his learning years in apprenticeship in a craft, he did not have the advantages of a classical education. However, he was well acquainted with literature, and later proved to be a fluent speaker and a talented and facile writer. He spoke German and French fluently, as well as his mother's native tongue, Dutch. Although of an ardent temper and impatient, he had indomitable perseverance and undaunted courage, as his later career demonstrated.

Finally, in the autumn of 1760 the partnership of father and son was dissolved, and John Lamb ventured into the business world as a wine merchant, importing spirits and sugar.[64]

Meanwhile, in February 1761 the names of Anthony and John Lamb were noted among the electors for candidates to the New York General Assembly.[65]

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[60] No examples signed by John Lamb are known.

[61] Gideon J. Tucker, (ordered by), *Names of Persons for Whom Marriage Licenses Were Issued by the Secretary of the Province of New York Previous to 1784* (Albany: Weed, Parsons, and Company, 1860) 220; *Records of Marriages*, 1: 208.

[62] Leake, *Memoir*, 9–10; Thomas Jones, History of New York During the Revolutionary War and the Leading Events in the Other Colonies at that Period (New York: For the New-York Historical Society, 1879), 2: 342–43.

[63] *The New-York Mercury*, 15 March 1756.

[64] Leake, *Memoir*, 9–10.

[65] Wilson, *The Memorial History*, 321, 367–75.

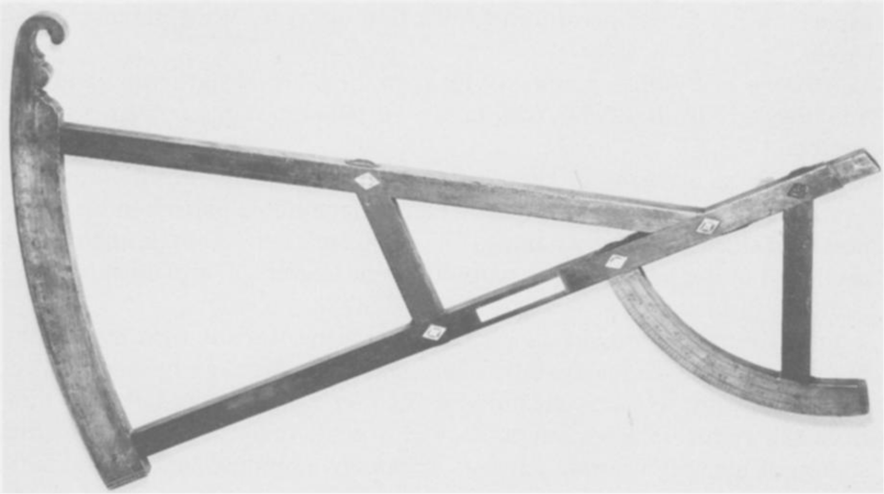

FIG. 25a. Backstaff made by Anthony Lamb ca. 1750–1760. Inscribed on one of the limbs are Lamb's initials and the serial number of the instrument, "A L 1016," which he would have stamped also on the vanes, which are missing. The limbs are made of rosewood and the arcs are of boxwood, with five elaborately decorated ivory inserts at the joints. Courtesy the Peabody Museum of Salem.

John Lamb, Wine Merchant

During the first several years of his new enterprise, John Lamb engaged in commercial relations with a certain Cairns of Havana, Cuba. From time to time Lamb shipped goods to him and in return received wines and other commodities in exchange. Cairns's account rose and continued to rise until it had exceeded the amount of four thousand pounds. At first Lamb expressed no concern, until he learned that Cairns had left Havana abruptly by ship en route to Liverpool. Cairns's ship foundered, but the passengers and crew were saved and taken to Charleston, South Carolina. From that city Cairns proceeded to write letters to his insuring agent post-

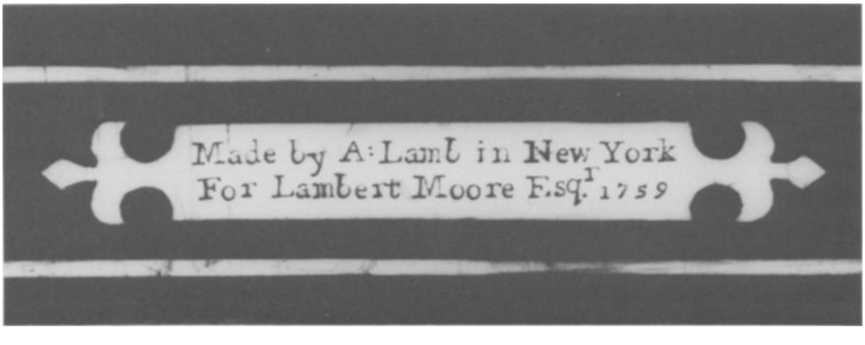

FIG. 25b. Detail of ivory name plaque on a gauging rod, inscribed "Made by A: Lamb in New York for Lambert Moore Esq.^{r} 1759." Courtesy the Streeter Collection of Weights and Measures, Yale University.

dated from Havana, in which he insured property which he claimed to have shipped on the ill-fated vessel, as if it were about to sail. The insurance was for a considerable amount, and he assured his creditors, including Lamb, that as soon as he had collected it their debts would be paid. Cairns collected the insurance, although it was suspected that the insured property had already reached England on another vessel. When the fraud was discovered, Cairns fled to parts unknown without having resolved his debts.

Inevitably the loss of Cairns's unpaid debt had a disastrous effect on Lamb's new endeavor. Coupled with his great impatience and lack of business acumen, it was not long before his business failed. Thereafter, although he attempted various other enterprises, always with the same initial enthusiasm, he was for the most part supported by assistance from his father and his wife's family until the advent of the American Revolution.[66]

The Haviland Instrument

In 1760 Anthony Lamb produced and promoted an unusual new scientific instrument designed for military use, which he described in some detail in an advertisement that appeared in April of that year in *The New-York Mercury:*

> *Suitable for Gentlemen of the Army*
>
> A Curious Instrument, useful for detaching of Men, (invented by Colonel William Haviland, of the 27th Regiment) it consists of two graduated Circles, one moving within the other, and is so easy to be understood, that it needs no other Direction, than to place the Number of Men to be detached (from any Company or Regiment) on the inner Circle, opposite the Number each Company or Regiment is to furnish, in a just Proportion, according to the Number of Men in each of them: It has on the Back of it, the Scheme for forming a Battalion, and is neatly made of Ivory, about three Inches Diameter, by ANTHONY LAMB, on Hunter's Quay, where Gentlemen of the Army may be supply'd with large Pocket Compasses, with or without Dials, Mahogany, Japann'd and Shagreen Case Telescopes; with all Kinds of Mathematical Instruments in the neatest and best Manner.[67]

The inventor, William Haviland, was an Irish-born career officer in the British Army who rose rapidly in his early years. Promoted to lieutenant colonel in 1752, he received the command of the 27th Regiment of Foot and in 1757 brought it to the American colonies. He commanded at Fort Edward in 1757 and 1758 and was present at Ticonderoga, where he temporarily commanded a brigade under General Sir Ralph Abercromby. Abercromby was replaced by General Jeffrey, Baron Amherst and in 1759 a three-pronged action was begun, with General Wolfe ascending the St. Lawrence to attack Quebec, Amherst penetrating into Canada from Ti-

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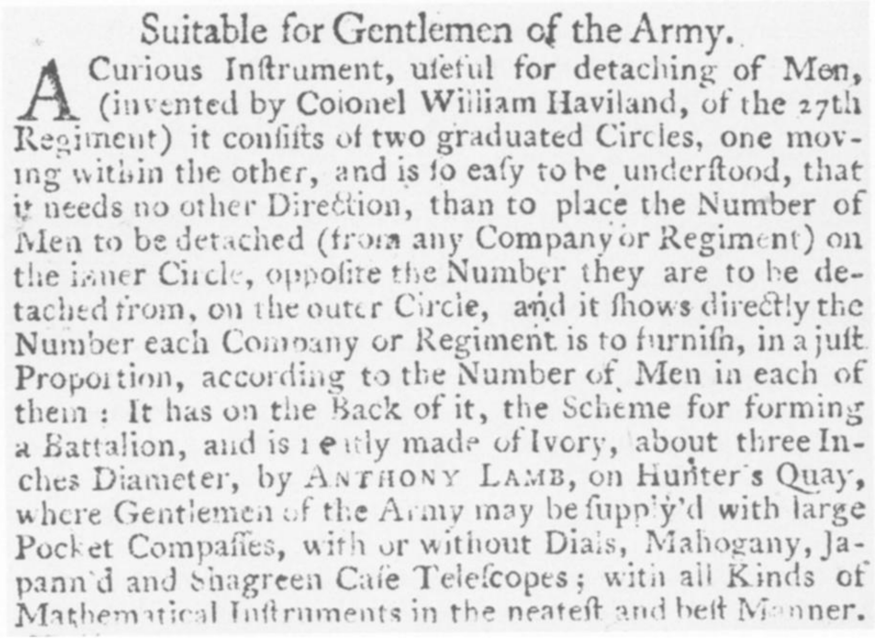
[66] Leake, *Memoir,* 9–10.

[67] *The New-York Mercury,* 14 April 1760; Bedini, *Thinkers,* 262–63.



Suitable for Gentlemen of the Army.

A Curious Inſtrument, uſeful for detaching of Men, (invented by Colonel William Haviland, of the 27th Regiment) it conſiſts of two graduated Circles, one moving within the other, and is ſo eaſy to be underſtood, that it needs no other Direction, than to place the Number of Men to be detached (from any Company or Regiment) on the inner Circle, oppoſite the Number they are to be detached from, on the outer Circle, and it ſhows directly the Number each Company or Regiment is to furniſh, in a juſt Proportion, according to the Number of Men in each of them: It has on the Back of it, the Scheme for forming a Battalion, and is neatly made of Ivory, about three Inches Diameter, by ANTHONY LAMB, on Hunter's Quay, where Gentlemen of the Army may be ſupply'd with large Pocket Compaſſes, with or without Dials, Mahogany, Japann'd and Shagreen Caſe Teleſcopes; with all Kinds of Mathematical Inſtruments in the neateſt and beſt Manner.

FIG. 26. Lamb's advertisement for the haviland instrument. From *The New-York Mercury*, 14 April 1760.

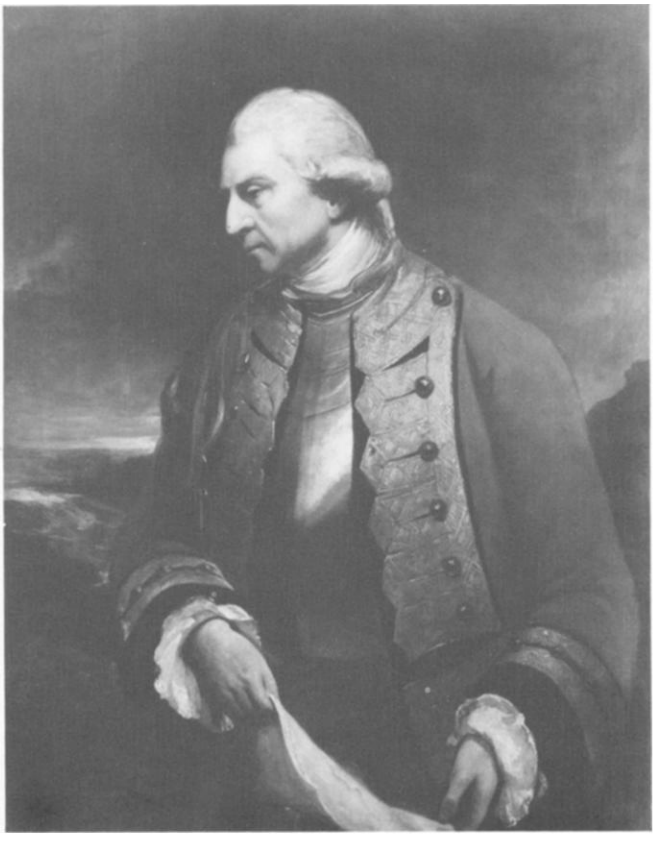


FIG. 27. Portrait of Colonel William Haviland. English eighteenth century, artist unknown. Courtesy the National Portrait Gallery, London.

conderoga and Crown Point to join General James Wolfe, while a smaller force under Sir William Johnson moved against Fort Niagara. In late July Niagara fell and the ultimate fate of Canada was decided in September on the Plains of Abraham. At the end of June Amherst's forces, including Haviland's 27th Regiment, assembled at the head of Lake George and arrived at Ticonderoga for the second time. Bringing up his artillery, Amherst began his siege and the enemy vacated the fort and retreated through Crown Point to Ile aux Noix. However, Amherst was unable to move, lacking protection for his own vessels, and the object of the expedition was not achieved.

In 1760 Haviland set out from Crown Point with a column consisting of the 1st Royal, 17th and 27th Regiments. Embarking at Crown Point with a large flotilla of whaleboats and rowboats convoyed by an armed brig, Haviland succeeded in taking the fort of Ile aux Noix and followed the French retreating to Montreal, joining the forces from Quebec until Amherst arrived, whereupon the French commander capitulated in September.

Haviland was said to possess considerable mechanical ingenuity and to have been the inventor of a type of pontoon designed for passing troops over rapids. His resourcefulness contributed materially to the success of the difficult operations to which he was frequently assigned.[68]

Haviland was stationed with the 27th Regiment of Foot at Crown Point, New York from October 1759 until April 1760. It was during this period that he visited the city of New York and sought out Lamb, who would have been immediately identified to him as a prominent and skillful maker of mathematical instruments. Haviland defined the functions of the instrument and provided Lamb with specifications and drawings, from which the latter was enabled to produce it.

The haviland instrument, unlike other mathematical instruments produced by Lamb and other makers in the eighteenth century, was not an instrument having wide distribution. It is, in fact, a "lost" instrument unknown at present to the military establishment for which it was made, and to historians of science and military history. For these reasons a detailed description of its forms and function are provided.

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[68] Sir Leslie Stephen and Sir Sidney Lee, eds., *The Dictionary of National Biography From the Earliest Times to 1900* (Oxford: Oxford University Press, 1973), 9: 183–84, "William Haviland; " Sylvanus Urban, Gent., *Gentleman's Magazine and Historical Chronicle,* vol. LIV for the year MDCCLXXXIII, Part the Second, 1784, p. 719; *The Royal Inskilling Fusiliers Being the History of the Regiment From December 1688 to July 1914.* Compiled Under the Direction of a Regimental Historical Records Committee (London: Constable & Co., Ltd., 1934), 76n., 88, 95, 99–104, 609–10; Captain John Knox, *An Historical Journal of the Campaigns of North America for the Years 1757, 1758, 1759, and 1760* (London: For the Author, 1769), 1: 157–58, 473, 478, 508, vol. II, pp. 488, 504, 526–27 n. 19, 529; 3: passim.

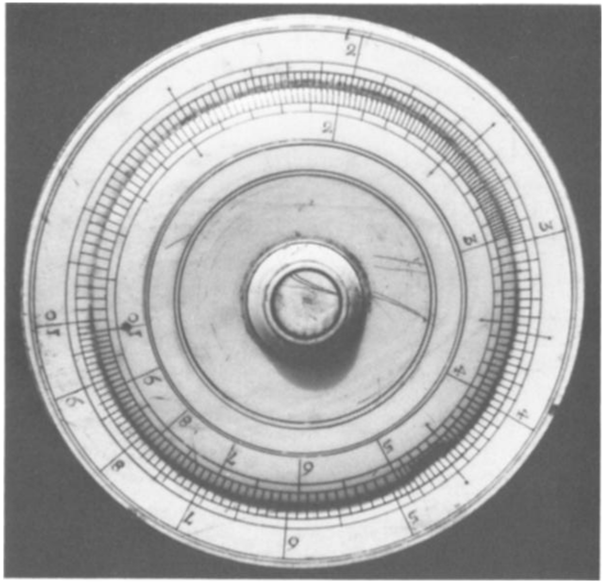
William Haviland (1718–1784) was born in Ireland of a military family. In 1739 he was appointed ensign in Spottiswoode's, also known as Gooch's, regiment of American provincials and served with it at Carthagena and Portobello. He served as aide-de-camp to Colonel William Blekney in the defense of Stirling Castle and later served in Ireland with the 27th Regiment of Foot (now the Royal Inskilling Fusiliers), rising rapidly to the rank of lieutenant colonel commanding the regiment. After the fall of Montreal in 1760 he served in Martinique in the West Indies and commanded a brigade at the conquest of Havana. During the American Revolution he held the command of Whitehaven and in 1779 commanded the western district of England when a French invasion was threatened. In 1767 he was appointed colonel of the 45th Regiment of Foot, having already been made major-general, rising to the rank of full general in 1783, the year before his death.

The haviland instrument was designed for use by the British Army infantry to serve two purposes. The first, as Lamb advertised, was for "the detaching of men" and it could be used to show "directly the number each company or regiment is to furnish in just proportion." Although most of the early and mid-eighteenth century drill manuals provided tables for determining the size of detachments, they were for the most part quite elaborate and difficult to use. The process was considerably simplified by the haviland and it would have been of the utmost utility in the field. There was a daily need for fatigue parties to stand guard duty, to haul provisions, to forage, to improve roads and defenses, and occasionally to form raiding or storming parties. These burdens as well as occasional losses had to be shared among the battalion's units. The British armies consisting of Regulars, Provincials and Militia operating in the American colonies during the Seven Years War were relatively large. The regimental adjutant, who had the task of choosing detachments from the companies, would have found the instrument to be particularly time-saving and useful to him, as it would have been also to the brigade-major in selecting detachments from the brigade.

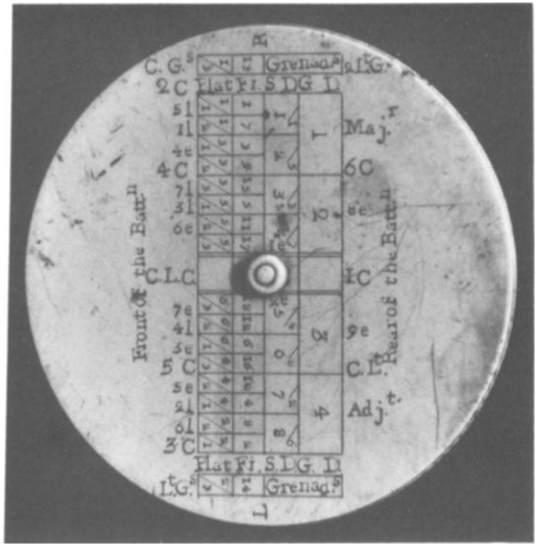
The instrument's second function was for breaking up the companies into tactical units to form the various divisions in giving fire. The battalion was formed into companies for purposes of administration and into several other units for tactical purposes. When the companies had been lined up together to form the battalion line, the officers moved along the line "telling off" the various tactical units to be used for the immediate purpose.

The obverse of the haviland instrument, to be used for selecting men for detachment, consists of a circular slide-rule, used for multiplication and division. It is formed with two concentric turning dials graduated on their perimeters from 1 through 10, with the smaller inner dial revolving opposite the outer one. The dials are arranged so that the total number of men composing the company or regiment, from which a selection is to be made, is identified on the outer circle. This number is aligned with a number of the inner dial that has been identified as the number of men to be detached. As an example, a battalion of 1,000 men of eight companies has 80 men in one of its companies. If it has been pre-determined that a total of 200 men are required for forage or other special duty, the figure 10 on the outer dial represents the number of men in the battalion, and the figure 2 on the inner dial indicates the number of men to be detached from the whole. All values must be scaled to within a range of 1 to 10. After lining up the 10 with the 2, the figure 8 is then located on the outer dial, and the figure opposite it on the inner dial—1.6 or 16—is the number of men to be detached from that company.

The instrument's second function was accomplished by means of the scheme engraved on the reverse side, which served as a guide for a coma.



b.



c.

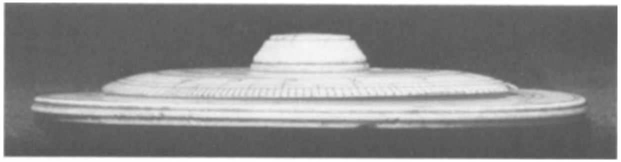


FIG. 28a. The haviland instrument. View of the upper surface, consisting of a circular slide rule. Ivory, 3¼ inches diameter. Although unsigned, it has been established to be the work of Anthony Lamb. b. The reverse side, inscribed with Colonel William Haviland's scheme for forming a battalion. c. Viewed from the side. Private collection.

manding officer in posting his men in such an arrangement as to obtain a constant platoon-fire of musketry across the face of the battalion. Because of space limitations, Haviland, or Lamb, resorted to the use of abbreviations and a condensed form to represent the components and the officers of the battalion.

The scheme was designed for a battalion consisting of nine regular "battalion-companies" and one grenadier company, the establishment authorized by the British Parliament during the period between 1748 and the end of 1763. After the peace of 1763, the establishment of the battalion was reduced to nine companies—eight regular and one grenadier company—due to the expenses incurred with the Seven Years War and the costs of maintaining a larger army thereafter. The fact that ten officers are identified on the instrument's scheme identifies the haviland as having been made and used during the period prior to 1764. Ten officers were required to command ten companies, three of them being a colonel, lieutenant colonel and major, and seven captains for the remaining companies. The second lieutenant, designated as the captain-lieutenant, commanded the colonel's company since the colonel of the regiment was seldom if ever present with the corps. In addition there were ten other lieutenants, of whom one acted as the regimental adjutant, and nine ensigns. The abbreviations used are self-explanatory, including "CG" for captain of Grenadiers, "1 LtGs" and "2 LtGs" for the first and second lieutenants of the Grenadiers, "CL^{t}" for captain-lieutenant, "C.L.C." for the colonel and lieutenant colonel, who stands in for the colonel; "Maj^{r}" for major, "C" for captain, "Adt^{t}" for adjutant, and "E" for ensign. Other abbreviations are "GD" for Grand Divisions, "SD" for Sub-Divisions, "Plat" for platoon, and "Fi" for firings.

On the scheme which appears on the instrument, the nine companies have lost their identity because they have been "told off" or broken into tactical units forming the various divisions for giving fire. In accordance with the regulation practice, the grenadier company was split into two sections to stand at the battalion's flanks. The battalion-companies have been told off into four Grand Divisions, eight Sub-Divisions, and sixteen platoons, in addition to the two platoons of the Grenadiers. These eighteen platoons have been told off into three firings.

The sequence in which the platoons fired, one after the other, is indicated in the column marked Firings ("Fi"). The three firings and the order in which the platoons composing a fire might fire is shown in the column marked Platoons ("Plat"). The right-hand platoon indicated on the scheme marked 1/1 and having "5L" inscribed in front of it is the first platoon of the first firing, while on its left is the first platoon of the second firing, etc. Platoons might fire in three waves, with all of the platoons of the first firing doing so at the same time, or individually, according to the sequence in which they are numbered.

The Sub-Divisions constituted larger firing units and could act as individual units on maneuvers. They are shown numbered from right to left with the sequence indicated according to which they would fire. Grand

Divisions were also maneuver units, and could act as fire units, firing as indicated by their numbers in the same manner, one after the other, although it was only rarely that they did so.

The scheme engraved on the instrument was represented as part of the regulations of 1748 in the *Amherst Manuscripts,* and as part of the regulations of 1756 in *A New Exercise. . . .* published in that year. It was incorporated in the *New Manual Exercise. . . .* for the 1757 regulations which appeared in 1758, and also featured in the eighth edition of *A Treatise of Military Discipline. . . .* by Humphrey Bland as revised by William Fawcett in the eighth edition published in 1759. Bland described the plan to be "for the better explaining, and the easier comprehending, of the different firings, and the distribution of the platoons of each firing in several parts of the Regiment" according to the current practice. Bland marked the platoons of the first firing "A," those of the second firing "B," and those marked "C" were of the third firing:

PLAN of a Battalion told off in eighteen platoons.

Grenadiers.	C.	1st platoon on the 3rd firing		
	A.	1st of the 1st	Right-hand sub-division and 1st to fire.	1st grand-division to fire.
	B.	1st of the 2nd		
	A.	3rd of the 1st	Left-hand sub-division and 5th to fire.	
	B.	3rd of the 2nd		
	C.	3rd of the 3rd	Right-hand sub-division and 3rd to fire.	3rd grand-division to fire.
	A.	5th of the 1st		
	B.	5th of the 2nd	Left-hand sub-division and 7th to fire.	
	C.	5th of the 3rd		
Colours.	D.	Reserve		
	C.	6th of the 3rd	Right-hand sub-division and 4th to fire.	2nd grand-division to fire.
		6th of the 2nd		
	A.	6th of the 1st	Left-hand sub-division and 8th to fire.	
	C.	4th of the 3rd		
	B.	4th of the 2nd	Right-hand sub-division and 2nd to fire.	4th grand-division to fire.
	A.	4th of the 1st		
	B.	2nd of the 2nd	Left-hand sub-division and 6th to fire.	
	A.	2nd of the 1st		
Grenadiers.	C.	2nd of the 3rd.[69]		

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[69] London, Kent Record Office. *Amherst Manuscripts,* No. 05/6, fol. 1, 1748 Regulations; *A New Exercise to be Observed by His Majesty's Troops on the Established Front of Great Britain*

Although the haviland may have been made by English instrument makers, a survey of the advertisements and trade cards of those active in the second half of the eighteenth century failed to bring to light any mention of it.

The slide rule, which forms the component on the obverse or upper side of the instrument, was not a new invention in Haviland's time, but the haviland appears to be its first application for military use. The invention is credited to William Oughtred, an English mathematician who claimed to have used both the straight and circular forms from about 1621. In 1630 Richard Delamain, a one-time teaching associate, published the first description of the circular slide rule, and two years later, William Forster, one of Oughtred's former pupils, translated Oughtred's Latin manuscript describing his "Circles of Proportion" into English. Oughtred gave permission to produce the first examples of his rules to Elias Allen, an eminent maker of mathematical instruments of that time, and they were subsequently made by others. They were generally made of boxwood, but brass and ivory were occasionally used as well. Various improvements of the instrument were made by others, including by William Nicholson, who devised many forms of the slide rule between 1787 and 1797. Among them was a circular slide rule similar to that devised by Oughtred, of which, however, Nicholson had no prior knowledge.[70]

It is the combination of two functions which distinguishes the haviland from the circular slide rule, which is useful for computations in multiplication and division. A single surviving example of the haviland instrument is known, made of ivory, measuring 3¼ inches in diameter, and inscribed

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and Ireland. . . . (London [1756], Re-printed 1757), 3; *New Manual Exercises as Performed by His Majesty's Dragoons, Foot-Guards, Foot, Artillery, Marines and by the Militia. . . .* (London: F. J. Millon, 1758), second edition, 25–26; Humphrey Bland, *A Treatise of Military Discipline: in which is laid down and Explained the Duty of the Officer and Soldier, Through the several Branches of the Service* (London: For H. Baldwin, J. Richardson, T. Longman, H. Woodgate, and S. Brookes, etc., 1759), eighth edition, revised by Sir William Fawcett, 78–79; J. A. Houlding, *Fit for Service. The Training of the British Army 1715-1795* (Oxford: Oxford University Press, 1981), 90-94, 195-201, 318-21, 416-27. The writer is greatly indebted to Dr. J. A. Houlding for the materials relating to the establishment of the British Army which have been used in this work.

[70] Florian Cajori, "On the History of the Gunter's Scale and the Slide Rule During the Seventeenth Century," *University of California Publications in Mathematics,* 1 No. 9 (17 February 1920): 187–209; "Slide (or Sliding Rule)," *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge* (London: Charles Knight & Co., 1842), 22: 129–34; A. J. Turner, "William Oughtred, Richard Delamain and the Horizontal Instrument in Seventeenth Century England," *Annali dell' Instituto e Museo di Storia della Scienza* Anno VI, 1981, fasc. 2, pp. 99–126; William Forster (transl. and ed.) *The Circles of Proportion and the Horizontal Instrument. Both Invented, and the Uses of Both written in Latine by Mr. W. O.* (London, 1632); Richard Delamain, *Grammelogia, or, The Mathematical Ring, Shewing any Reasonable Capacity that hath not Arithmeticke how to resolve and worke all ordinary operations of Arithmeticke . . .* (London: John Haviland, 1630); Richard Delamain, *Grammelogia, Or, The Mathematical Ring. Extracted from the Logarythms and projected Circular. . .* (London: R. Delamain, N.D.); "The Principles and Illustration of an advantageous Method of arranging the Differences in Logarithms, or lines graduated for the Purpose of Computation. By Mr. William Nicholson, communicated by Sir Joseph Banks, Bart., F.R.S.," *Philosophical Transactions of the Royal Society,* 17 (for 1787): 246–52, Tab. X.

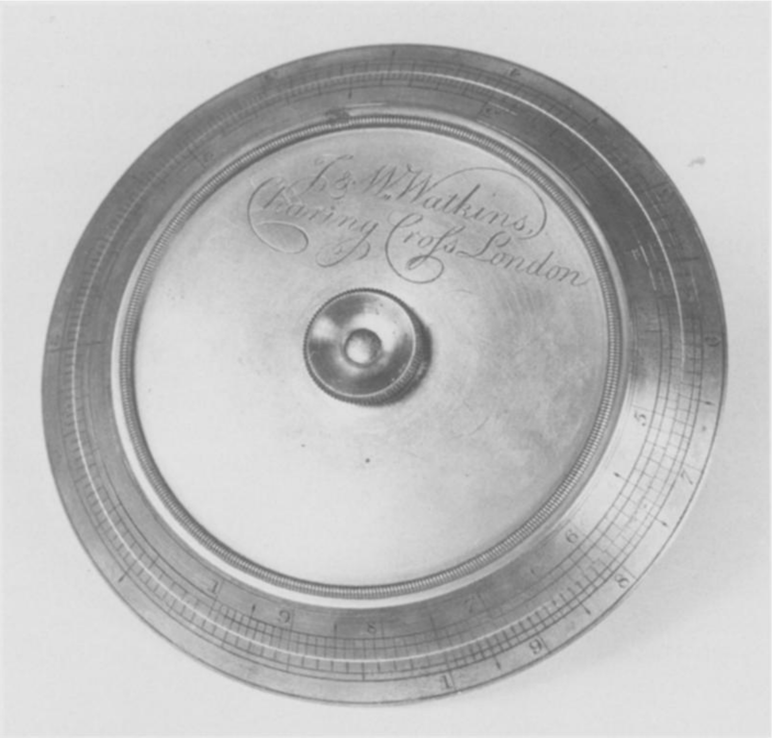
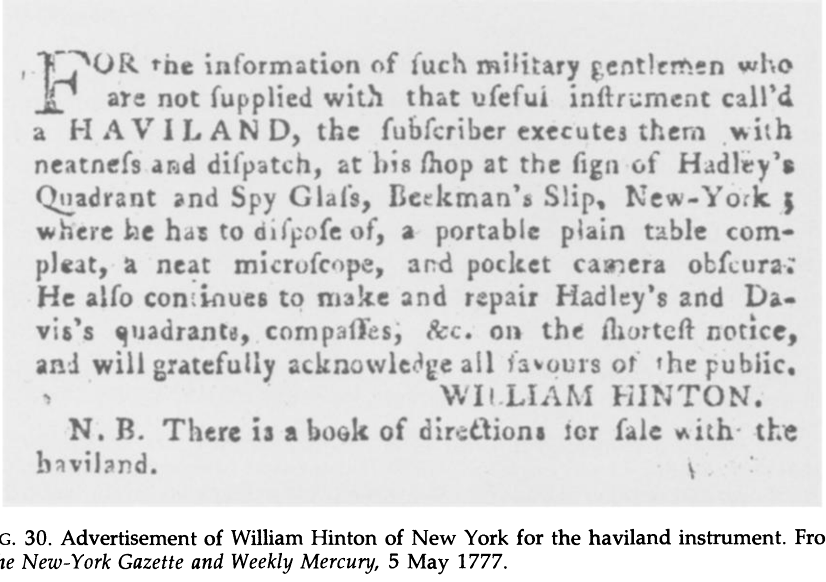


FIG. 29. Circular slide rule, brass, made by J. & W. Watkins of London, fl. 1790–1817, comparable to circular slide rule of the haviland instrument. In the Whipple Museum of the History of Science, Cambridge University. Photograph courtesy Dr. Gerard L'E. Turner, Oxford University.



FOR the information of ſuch military gentlemen who are not ſupplied with that uſeful inſtrument call'd a HAVILAND, the ſubſcriber executes them with neatneſs and diſpatch, at his ſhop at the ſign of Hadley's Quadrant and Spy Glaſs, Beekman's Slip, New-York; where he has to diſpoſe of, a portable plain table compleat, a neat microſcope, and pocket camera obſcura: He alſo continues to make and repair Hadley's and Davis's quadrants, compaſſes, &c. on the ſhorteſt notice, and will gratefully acknowledge all favours of the public.

WILLIAM HINTON.

N. B. There is a book of directions for ſale with the haviland.

FIG. 30. Advertisement of William Hinton of New York for the haviland instrument. From *The New-York Gazette and Weekly Mercury,* 5 May 1777.

in black on both sides. On the scheme for forming a battalion the initial letters used to designate commissioned officers are marked in red. The graduated scales are scribed, all letters and digits are marked by means of heated metal die stamps, and the inscription filled in with color.

The instrument does not bear the signature or initials of Anthony Lamb, but it has nonetheless been established that it is an example of his work. A comparison made under high magnification of the individual letters and digits of the haviland instrument with those on the ivory name plaques of his signed backstaffs and the gauging rod reveal that they are identical in every instance and made with the same die stamps. Individual characteristics in the formation of the letters and digits, such as broken serifs and faint spots coincide in every instance. Lamb had a special affinity for working in ivory and was skilled in its use.

Apparently the haviland instrument was not a mere curiosity "for the military gentleman who has everything." It must have enjoyed a substantial amount of popularity and use, for seventeen years after Lamb advertised it, the same instrument was being produced by William Hinton, another New York instrument maker. The American Revolution had already begun, and New York was occupied by the British, suggesting that Hinton was a loyalist, producing instruments for the British Army.

In 1777 Hinton advertised in *The New-York Gazette and The Weekly Mercury:*

> For the information of such military gentlemen who are not supplied with the useful instrument call'd a Haviland, the subscriber executes them with neatness and dispatch, at his shop at the Sign of Hadley's Quadrant and Spy Glass, Beekman's Slip, New York: where he has to dispose of, a portable plain table compleat, a neat microscope, and pocket camera obscura. He also continues to make and repair Hadley's and Davis's quadrants, compasses, &c., on the shortest notice, and will gratefully acknowledge all favours of the public.
>
> William Hinton.
>
> N.B. There is a book of directions for sale with the haviland.[71]

Hinton was a relative newcomer on the New York scene, and in his first advertisement which had appeared five years earlier, he offered as wide a range of mathematical instruments as did Lamb, in addition to violin bows, billiard balls and tacks, "and a Variety of other articles too tedious to mention: and as he is a young Beginner, he flatters himself, he shall meet with Encouragement. . . ." [72]

The haviland instruments made and sold by Hinton were probably made of brass instead of ivory, and the upper surface would have been similar to that of instruments made by Lamb. However, the scheme on the reverse would have been modified to conform to the new regulations of 1763, with eight battalion-companies instead of nine, and one grenadier company.

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[71] *The New-York Gazette and the Weekly Mercury,* 5 May 1777. No example of the haviland instrument, nor copies of his "book of directions" for its use, made by William Hinton are presently known.

[72] Hinton's first advertisement appeared in *The New-York Gazette and the Weekly Mercury,* 4 May 1772. Another advertisement was published in the same newspaper on 4 September 1780. Hinton died early in 1784, and his estate was administered by John Hinton, his brother who was a cutler, and by William Smith, yeoman, his brother-in-law. The documents of his estate's administration are in the *Historical Documents Collection,* Queen's College of the City University of New York.

The presumed usefulness of the haviland instrument appears to be confirmed by the inclusion of a definition of the instrument in the fourth edition of Charles James's *An Universal Military Dictionary. . . .* published more than fifty years after Lamb advertised the instrument. Curiously, the definition does not appear in the first three editions of James's work, but the fourth edition, published in 1816, lists the, "HAVILAND, a brass machine made for the purpose of fixing a military roster. It is so called from General Haviland, who was the inventor." [73]

Some months after having advertised the haviland instrument, Lamb again resorted to the press to inform the public that it could obtain:

> Maps, Plans, Coats of Arms, Shop Bills, Monthly Returns, and other Engravings neatly done on Silver, Copper, &c., with Care and Dispatch, and all Sorts of Copper Plate Printing done in the best Manner, at reasonable Rates, at Anthony Lamb's at Sir Isaac Newton's Head, in New-York.[74]

One of Lamb's instruments which has an interesting attribution and which may have been made in about this period is a traveling pocket compass made of brass. It is owned by the Seabury family with the tradition that it originally belonged to Bishop Samuel Seabury, the first American bishop in the Anglican Church. He was also trained as a physician and at various times he practiced medicine and conducted a school in addition to his parish duties. Sir William Johnson urged him to form a mission at Johnstown, New York but Seabury refused. He was a dedicated loyalist and worked to prevent the election of committees and delegates to Provincial and Continental congresses. Although he went into hiding, he was captured by a troop of Connecticut horsemen led by Isaac Sears and confined for a time. He moved to New York when the British took possession of the city, and entering the British lines, he served as a guide to the army on Long Island and in Westchester. Whether the compass served him in these activities can only be speculated.[75]

Commission for Sir William Johnson

Three years after Lamb had begun to market the haviland instrument, he was visited by William Darlington, agent for Sir William Johnson, with a.

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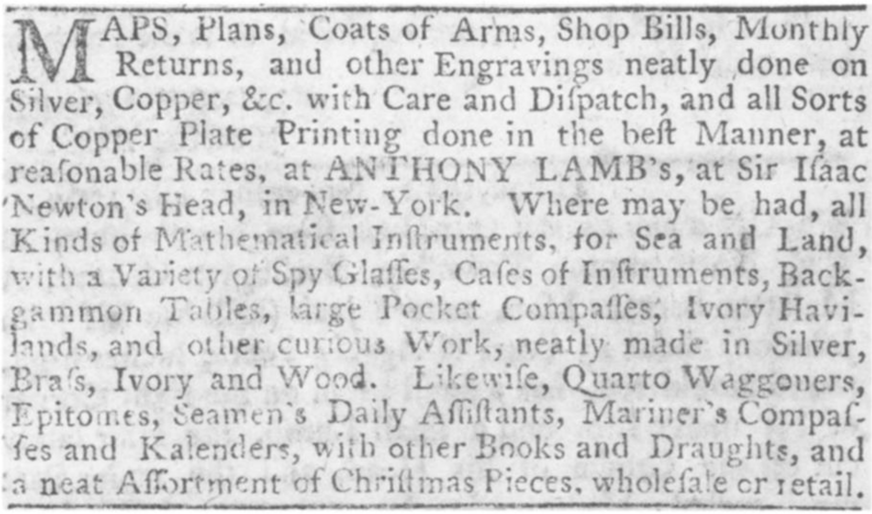
[73] Charles James, *An Universal Military Dictionary, In English and French, in Which are Explained the Terms of the Principal Sciences That are Necessary for the Information of an Officer* (London: For T. Egerton, 1816), 4th edition, 358.

[74] *The New-York Mercury,* 1 December 1760.

[75] Dumas Malone, ed., *Dictionary of American Biography* (New York: Charles Scribner's Sons, 1935), 8: 528–30, "Samuel Seabury." The compass measures 3½ inches in diameter and approximately ¾ inches in height, consisting of a case of turned brass decorated with scored lines and having a protective glass cover, with an engraved paper compass dial graduated in degrees with sixteen directional divisions.



MAPS, Plans, Coats of Arms, Shop Bills, Monthly Returns, and other Engravings neatly done on Silver, Copper, &c. with Care and Diſpatch, and all Sorts of Copper Plate Printing done in the beſt Manner, at reaſonable Rates, at ANTHONY LAMB's, at Sir Iſaac Newton's Head, in New-York. Where may be had, all Kinds of Mathematical Inſtruments, for Sea and Land, with a Variety of Spy Glaſſes, Caſes of Inſtruments, Back-gammon Tables, large Pocket Compaſſes, Ivory Havilands, and other curious Work, neatly made in Silver, Braſs, Ivory and Wood. Likewiſe, Quarto Waggoners, Epitomes, Seamen's Daily Aſſiſtants, Mariner's Compaſſes and Kalenders, with other Books and Draughts, and a neat Aſſortment of Chriſtmas Pieces, wholeſale or retail.

b

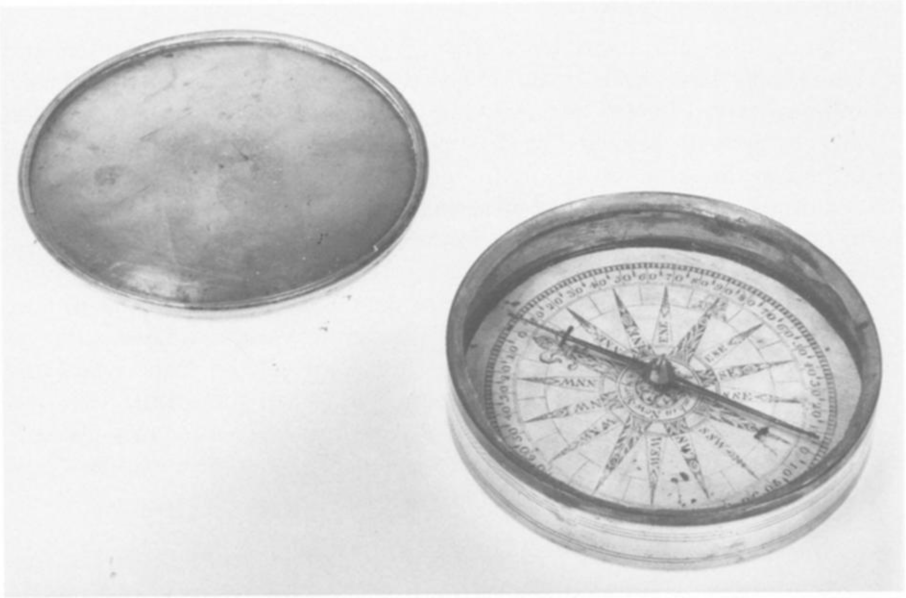
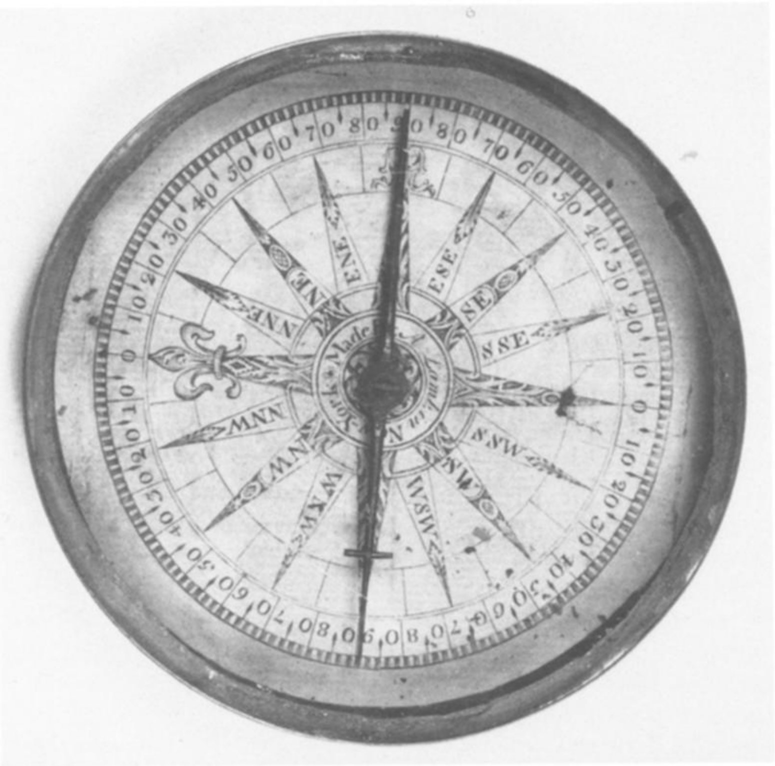


FIG. 31a. Lamb's advertisement for maps, plans, business forms and other materials he engraved and sold. From *The New-York Mercury,* 1 December 1760. b. Traveling pocket compass of brass made by Anthony Lamb. The paper compass card, although unsigned, may have been engraved by Henry Dawkins. c. Detail of the engraved paper compass card of the Seabury traveling compass. At the Glebe House. Courtesy The Seabury Society for the Preservation of The Glebe House.

c.



a commission to produce several instruments for the latter. Johnson was a major figure in the struggle between the English and the Indians for possession of the lands settled in the name of the Crown. With the outbreak of King George's War he negotiated with the Six Nations and prevented them from joining the French. He received command of fourteen companies of New York militia raised to defend the frontier and after peace was assured, he resumed his fur trading and agricultural pursuits.[76]

Through Darlington, Lamb received an order for a sundial and other instruments for Johnson. In a badly damaged letter from Darlington to Johnson written on 10 January 1763, relating to various business matters, Darlington wrote "[ ] spoke to M^{r}. Lamb about the Sundial and Scale and [ ] You particularly about them," and then went on to write on other subjects.[77] On 15 January Lamb addressed a letter concerning the instruments directly to Johnson.

> S^{r}.
>
> M^{r}. Darlington Showd me your Le[tter] Mentioning the Scale with a Silver joynt, and a Dyal, if any Imported would have Answered I would have sent you one

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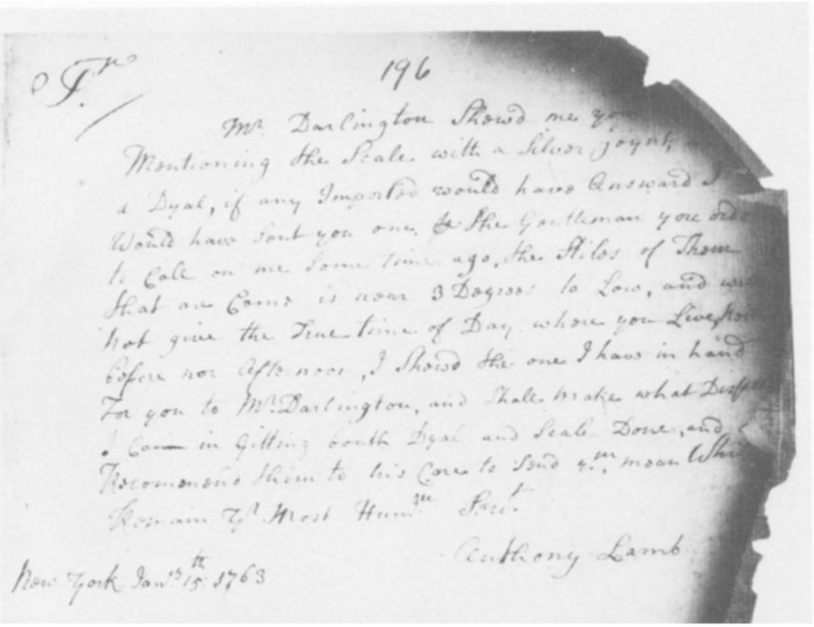
[76] Malone, *Dictionary,* 5: 124–28, "Sir William Johnson;" Augustus C. Buell, *Sir William Johnson* (New York: D. Appleton and Company, 1903), passim.

[77] The New York State Library, Manuscripts Division, *The Papers of Sir William Johnson.* Letter from William Darlington to Sir William Johnson, 19 January 1763.



196

M^{r} Darlington Showd me y
Mentioning the Scale with a Silver joynt,
a Dyal, if any Importd would have Answard
Would have Sent you one, & the Gentleman you or
to Call on me Some time ago, the Stiles of Them
that are Come is near 3 Degrees to Low, and wi
not give the True time of Day where you Live No
before nor After noon, I Showd the one I have in hand
For you to M^{r} Darlington, and Shall make what Disp
I Can in Gitting bouth Dyal and Scale Done, and
Recommend them to his Care to Send y^{m}, mean Whi
Remain Y^{r} Most Hum^{ble} Ser^{t}

Anthony Lamb

New York Jan^{ry} 15th 1763

FIG. 32. Letter from Anthony Lamb to Sir William Johnson, 15 January 1763. From *The Papers of Sir William Johnson.* Courtesy the New York State Library.

[as per?] the Gentleman you ordered to Call on me Some time ago. the Stiles of Them that are Come is near 3 Degrees to Low, and will not give the True time of Day where you Live, Neither before nor After noon. I Showd the one I have in hand For you to M^{r}. Darlington, and Shall make what Dispatc[h] I can in Gitting bouth Dyal and Scale Done, and I [ ] Recommend them to his Care to Send y^{m}., mean While [ ] Remain

Y^{r}. Most Hum^{ble} Serv^{t}.
ANTHONY LAMB.[78]

On 11 April Lamb wrote to Johnson, enclosing an ivory scale, a sundial made for the latitude of 43°30′, and "seeds of apple of curious sort."[79] A fire in the New York State Library in 1911 destroyed the original letter and many others among the Johnson Papers, and damaged a number of those that escaped total destruction from the flames, including the two previously noted.

The Society for the Promotion of Arts

Following his ill-fated venture with Cairns in the importation of spirits and sugar, John Lamb attempted other pursuits but experienced difficulty in establishing himself in another business. However, within a short period he became associated with Obadiah Wells and James Armstrong and other New York merchants in the "Society for the Promotion of Arts, Agriculture, and Oeconomy, in the Province of New York, in North America." The Society was established late in 1765 and was modeled on the Society of Arts, often called the Premium Society, which had been founded in London a decade earlier. The New York group was formed for the purpose of "advancing husbandry, promote manufacture, and suppress luxury," and was inspired by "the present deplorable State of our Trade," according to the first announcement published in the New York newspapers. The New York Society communicated with the Society in London and also with other English and colonial American correspondents seeking practical improvements. Premiums for products in agriculture and manufacturing were offered, and special emphasis was given to the production of linen.[80] The Society advertised

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[78] *Johnson Papers.* Letter from Anthony Lamb to Sir William Johnson, 15 January 1763.

[79] Alexander C. Flick, ed., *The Papers of Sir William Johnson* (Albany: The University of the State of New York, 1925), 4: 85–86; Richard E. Day, compiler, *Calendar of the Sir William Johnson Manuscripts in the New York State Library* (Albany: The University of The State of New York, 1909), 166.

> Wanted (by the Society for promoting Arts, &c.) 50 Spinning Wheels, Any Persons having it in their Power to furnish that Number immediately, are requested to apply to Messrs. Obadiah Wells, James Armstrong, and John Lamb, who will agree with them for the same.[81]

The committee soon collected the required number of spinning wheels, two reels, two looms, and with ample funds available for expenditure, Wells directed the Society's first linen manufactory, and kept it in operation for at least one and one half years. Two schools for spinning were associated with the manufactory, and later more spinning wheels and reels were acquired and distributed to the poor as loans. The homespun linen produced was widely advertised in the press in an effort to sell it and collect funds to continue employment.

On the last day of the year 1767 the Society placed a large advertisement in the newspapers reporting that its efforts had been most successful for many purposes, particularly the encouragement of the raising of flax and the manufacture of linen. The trustees of the Society had raised the sum of six hundred pounds with which to employ weavers and spinners, and had employed more than three hundred poor and needy persons for the past eighteen months in the linen business. It now had on hand linens to the value of that amount which had been produced in the city and county, and was anxious to dispose of them. In an effort to do so, the linens were being sent about the city and the people were urged to purchase them so that even greater numbers of distressed women now in the poorhouse and others engaged in beggary could be put to work.

In January 1768 the press reported a meeting of the Society and noted its efforts to encourage the manufacture of cloth in the colonies so that it did not have to be purchased from England. It specified that a number of families in Woodbridge, New Jersey had produced great quantities of woolen and linen cloth at home during the past year.

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[80] Alexandra Oleson and Sanborn C. Brown, *The Pursuit of Knowledge in the Early American Republic* (Baltimore: The Johns Hopkins University Press, 1976), 89–92; Brooke Hindle, "The Underside of the Learned Society in New York 1751–1854;" advertisement in *The New-York Gazette or the Weekly Post-Boy,* 29 November 1764.

[81] *The New-York Mercury,* 25 February 1765.

The activities of the Society declined after the repeal of the Stamp Act, despite efforts made through the press to encourage cloth manufacture and purchase, and its last meeting was held on February 1768.[82] John Lamb remained active in the Society until its demise, at about the time that he became totally involved with the activities of the Sons of Liberty as the clouds of war began to gather over the colonies.

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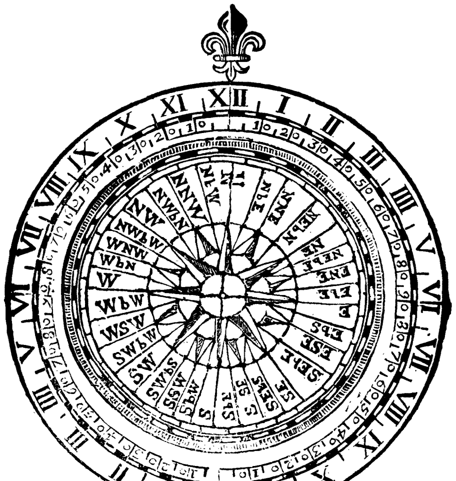
[82] Other advertisements of the Society appeared in *The New-York Gazette, or the Weekly Post-Boy* on 15 October 1767, 31 December 1767, and 18 January 1768.



VI. THEN THE REVOLUTION

The Sons of Liberty

John Lamb was among the first in New York to embark on the events leading to the American Revolution. He was one of the principal agitators protesting British encroachments upon American trade and related vexations. Soon after the Stamp Act was passed in 1765, he became one of the most prominent members of the Sons of Liberty of New York. He was a persuasive speaker and was one of the organization's most frequent spokesmen. He proved to be a talented writer and many of his incendiary writings directed against the British Crown appeared in newspapers in Boston and New York. He also produced many handbills, which he sometimes signed as "A Plebian" or as "A Mechanic." [83]

At first the Sons of Liberty operated as a secret party, and identified itself variously as the "Sons of Neptune," "Vox Populi," and the "Free Sons of New York." Lamb was one of the signers of the non-importation bill, and at the meeting of the merchants held on that occasion, it was proposed to organize a committee to correspond with patriots in the other colonies. Many leading names were proposed, but all refused the duty. Finally five men volunteered their services and were accepted. They were the most ardent members of the Sons of Liberty, and included Isaac Sears, John Lamb, Gershom Mott, William Wiley, and Thomas Robinson. Although Sears and Lamb were merchants and popular leaders, it is curious that the two hundred assembled conservative merchants of New York selected men having relatively little involvement in city affairs. During the next several years the members of the committee corresponded extensively with their counterparts in other colonies and traveled to meetings with them. Lamb spent a substantial amount of time in Philadelphia on the committee's business during this period.

When it was learned that Messrs. Pintard and Williams had used stamped paper, the Sons of Liberty went into action. Lamb, Sears, and another named Allicocke marched in broad daylight to the homes of the offenders. Pintard and Williams were seized and taken to the common where they were saved from being pilloried only by the appeals of the clergymen of the city. They were put on their defense, and made to make humble submission on the common, again on their doorsteps, and later by oath published in *The New-York Gazette.*[84]

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[83] Henry B. Dawson, *Mass Violence in America. The Sons of Liberty in New York* (New York: Arno Press & The New York Times, 1969) pp. 84–87, 104–18; Leake, *Memoir,* 13–93; Jones, *History of New York,* 1: 39, 62–65; 2: 342–43, 367–76; Benson J. Lossing, *The Pictorial Field-Book of the Revolution* (New York: Harper & Bros., 1860), 1: 463, 466, 473; 2: 581–88; Wilson, *The Memorial History,* 2: 367–75.

During this period Lamb made another attempt to establish himself in a business of his own, and on 31 January 1769 he appeared before the mayor and the aldermen, was inscribed on the Rolls as a "Merchant," and became a Freeman of the city.[85]

In December 1769 the intrepid Lamb publicly denounced the New York Assembly for remaining subservient to the authority of the royal governor. By this time his activities had become well known, and he was suspected of having been the author of anonymous handbills which were arousing the people. He was summoned before the bar of the House for examination, but lack of sufficient evidence resulted in having the case dismissed.[86]

Upon learning of the battle of Lexington, Lamb and Sears seized the New York customs house and prevented vessels bound for England from leaving the harbor. Then with other members of the Sons of Liberty, Lamb succeeded in confiscating the military stores maintained at Turtle Bay.[87]

It was probably during this period that John Lamb made the acquaintance of Christopher Colles, possibly when the latter visited "At Sir Isaac Newton's Head" for assistance with parts for one of his inventions, or to repair one of his instruments. Colles, an Irish-born engineer, mechanician and science lecturer, had settled first in Philadelphia and then moved to New York in late 1773 or early 1774. He proposed the construction of a reservoir and a system of conduit pipes and a pumping engine, which would supply water to New York, a project completed in early 1776.

Lamb and Colles became fast friends, remaining so for the rest of their lives. It was undoubtedly from Colles that Lamb gained his knowledge of artillery. With the outbreak of hostilities, Colles capitalized on the military needs of the Continental Army, and presented lectures on the principles of projectiles and gunnery for training American artillery officers, among whom may have been John Lamb. Colles continued his teaching until the artillery branch was remodeled by Baron Friedrich Wilhelm von Steuben after his arrival in the States in 1777.[88]

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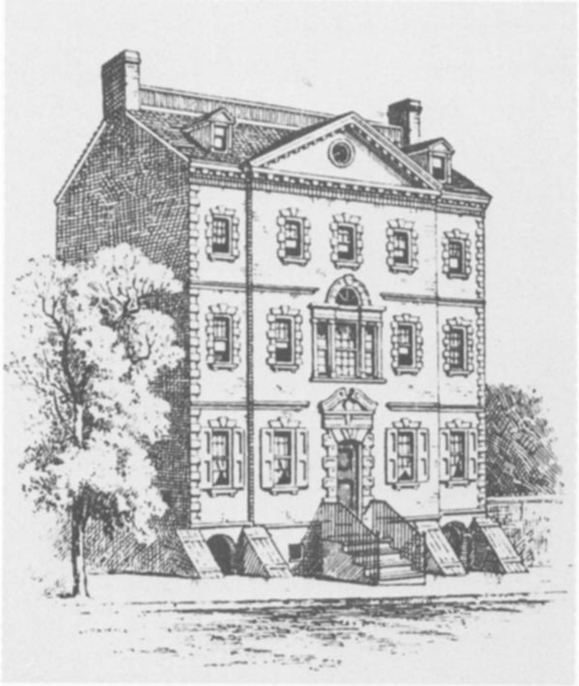
[84] Benson J. Lossing, *The Empire State. A Compendious History of the Commonwealth of New York* (Hartford, Conn.: American Publishing Co., 1888), 206; Leake, *Memoir,* 24.

[85] *Burghers and Freemen,* 217.

[86] *Journal of the Votes and Proceedings of the General Assembly of the Colony of New York 1695–1765* (New York: N.P., 1764–1766), 2: 44–47; Leake, *Memoir,* 50–52; O'Callaghan, *The Documentary History* 3: 536.

[87] Leake, *Memoir,* 102; Lossing, *Field-Book,* 588–89.

[88] [Christopher Colles], *A Survey of the Roads of the United States of America 1789 by Christopher Colles.* Edited by Walter W. Ristow (Cambridge, Mass.: The Belknap Press of the Harvard University Press, 1961), 16–20, 24, 37, 42, 48, 70–72, 84; J. A. Stevens, "Christopher Colles," *The Magazine of American History,* 2 (1878): 340–48; Richard D. Doyle, "Christopher Colles, Engineer and Philosopher," *Historical Bulletin* (Chicago: Loyola University Press), 9 (March 1931): 47–49; Leake, *Memoir,* 105–06.



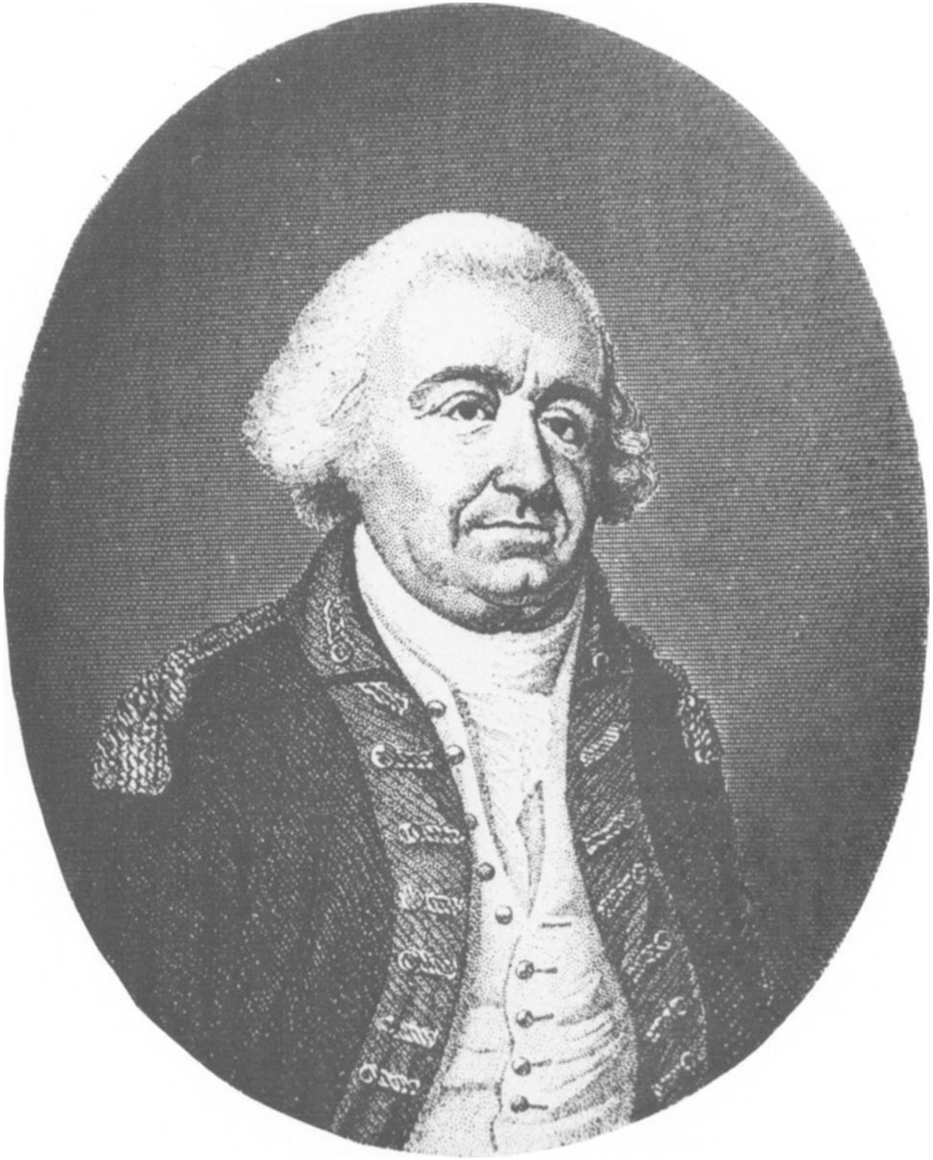


FIG. 33. The house of John Lamb, which was besieged by the Federalists. From *The Memorial History of the City of New-York From Its First Settlement to the Year 1892* by James Grant Wilson (New York, 1892, vol. 2).

FIG. 34. Portrait of General John Lamb in later life. From *Memoir of the Life and Times of General John Lamb . . .* by Isaac Q. Leake (Albany, 1857).

Lamb's knowledge of the construction and operation of scientific instruments which he had gained in his father's shop, coupled with the instruction in gunnery and engineering he acquired from Colles, undoubtedly were largely responsible for his mastery of artillery, which was constantly noted throughout his service and which substantially advanced his military career.

John Lamb and the Continental Army

When Fort George and the Batteries of New York were dismantled by General Lee in the spring of 1775, and the cannon and stores removed to the Fields, John Lamb was made Master-General of Ordnance. In July of the same year he received the commission of captain of an artillery company and joined the army of General Richard Montgomery in the invasion of Canada. During the siege of St. John's, Montgomery found occasion to express considerable displeasure with Lamb's behavior, particularly noting his bad temper and troublesome personality, and described him as "a restless genius."

During the assault on Quebec on 31 December 1775, Lamb was wounded and lost the sight of an eye. He was captured by the British and after a few months was released on parole. He was appointed a major of artillery of the northeast department of the Continental Army in 1776, but was forced to remain inactive until he had been exchanged with other prisoners in January 1777.

During this period of inactivity, in September 1776, Lamb moved his wife and children out of New York to Stratford, Connecticut for safety. He rented the house of Robert Walker, a friend and fellow soldier, and the Lamb family remained at Stratford until April 1777. He then moved to Southington, and traveled throughout Connecticut to recruit men for his regiment. He had difficulty recruiting, until General Benedict Arnold, who was stationed in nearby New Haven, came to his assistance and provided one thousand pounds for Lamb's use in this endeavor.[89]

At some time during the same year Lamb provided gunnery instruments to artillery units in the eastern department of the Continental Army. Among the unpublished papers of Brigadier General Henry Knox in charge of the Continental artillery is a document with a cover sheet labeled "Instruments made for the Artillery by Mr. John Lamb 1777." Attached is a listing in another hand of the distribution made of the instruments:

1777

July 20	6 P.^{r} of Callippers Deliv.^{d} to Coll.^{l} Jn.^{o} Lamb
	6 Gunners Quad.^{ts} to D.^{o}
	6 Scales to D.^{o}
	24 Quadrants to Go to Coll.^{l} Masons At Springfield

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[89] Malone, *Dictionary,* 5: 555–56, "John Lamb"; Jones, *History of New York* 2: 622–23; O'Callaghan, *The Documentary History,* 2: 215–16, 3: 367–79, 481–85, 536–37.

12 P.^{r} of Callippers to D.^{o}
6 Scales to D.^{o} -- -- D.^{o}

May 6 2 P.^{r} of Small Callippers Sent to PeeksKill to Col.^{l} Cheevers
1 P.^{r} of Large D.^{o} Sent to D.^{o} per Coll.^{l} Livingston
1½ Doz.^{n} Callippers Sent to Coll.^{l} Broom to the Care of Cap.^{t} W.^{m} Bull at Hartford to be forwarded to Coll.^{l} Mason
2 Doz.^{n} of Scales to -- D.^{o} per Order of Coll.^{l} Jn.^{o} Lamb &
2 P.^{r} of Large Callippers Sent per M.^{r} John Thomas to D.^{o}

22 Sent ½ a Doz.^{n} of Gunners Quad.^{ts} Sent to Springfield per M.^{r} John Banks per Order of Coll.^{l} Jn.^{o} Lamb Which he Brought as per Order for from M.^{r} Sam.^{l} Bridge, Clark

Despite the label on the cover sheet, it is unlikely that Colonel Lamb personally produced the total of 112 instruments listed, inasmuch as he was fully occupied recruiting men for the Army and with other military activities. The instruments were undoubtedly being produced by Anthony Lamb who was then living either in his son's home in Connecticut or nearby. Despite the great need for gunnery instruments in the Continental Army, few of the colonial American instrument makers were active in their production during the years of the war.[90]

While Lamb was recruiting in Connecticut, Major General Tryon sent some twelve hundred seasoned troops from New York which disembarked at the mouth of the Saugutuck River. They marched unopposed to Danbury, where they raided the town and burned one of the most important depots of supplies of the Continental Army. On their return toward Norwalk they marched through Ridgefield. General David Wooster in New Haven was alerted, and responded promptly, arousing the countryside and collecting men to intercept the British at Ridgefield. He divided the forces with General Benedict Arnold, and as he harassed the British march from the rear, Arnold with Lamb engaged them from the front.

At Ridgefield, "a few brave Men, headed by two Gallant Officers, General Arnold and Col. Lamb, attack'd them in Front, while General Wooster, as mention'd above, harassed their Rear, and Kill'd, as I was told by People of that Place upwards of thirty." Wooster was mortally wounded, and taken by wagon to Danbury, where he died. Meanwhile Arnold and Lamb pursued the departing raiders to their point of embarkation where British ships awaited them. During a heroic engagement at Compo Hill, as Lamb was leading his men forward, a grape shot tore through his side close to the backbone. He was taken to an improvised hospital and narrowly escaped death. General Tryon's report to London, which greatly magnified the success of his expedition, noted Lamb as having been killed.[91]

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[90] Massachusetts Historical Society, Manuscripts Collection. *The Papers of Henry Knox,* vol. 3, item 180, 89a. Courtesy of Donald W. Holst.

[91] Silvio A. Bedini, *Ridgefield In Review* (New Haven: Walker-Rackliff Company, 1958), 71, 84; Leake, *Memoir,* 154–64; The New-York Historical Society, Manuscripts Divisions, *The Papers of General Horatio Gates.* Letter from Hugh Hughes to General Gates, 3 May 1777.

In June 1779 Lamb was ordered by General Washington to the command of West Point and was in charge at the time of Arnold's defection. He was a participant in the siege of Yorktown, and in 1783 he was brevetted a general in the Continental Army.[92]

John Lamb's Post-War Years

As the war of independence came to a close, John Lamb returned to his home at 34 Wall Street in New York, although his family remained in Southington for some time longer. He was chosen a member of the General Assembly and served on several committees. With government certificates for pay and service, he was able to purchase public lands and successfully speculated in real estate, becoming a man of considerable means. The Council appointed him Collector of Customs for the Port of New York, and he maintained offices in part of his home, vacating his seat on the Assembly to undertake his new duties.

Lamb was made chairman of the "Federalist Republicans," an association which was strongly opposed to the ratification of the Federal Constitution. So outspoken was he in his opposition that Lamb aroused the ire of the Federalists to a considerable degree, and his home was threatened by a Federalist mob. Although bedridden with gout, Lamb sent the women of his household to stay with friends, and fortified his house with a garrison consisting of several youths and relatives.[93]

When the Federal government was organized in 1789, President Washington appointed him to the office of Collector of Customs, an appointment that was unanimously approved by the Congress. From the time of his service in Canada, Lamb suffered severely from gout, and now its attacks became increasingly frequent, causing him to be absent from his office and confined to his house. However, his son-in-law, Captain Charles Tillinghast, managed the office for him with competence until he became a victim of a yellow fever epidemic and died. During Tillinghast's illness, the management of the office was entrusted to another employee, who after a time left the position abruptly and sailed to England. In due course a large shortage of funds was discovered, and although there was ample reason to suspect the departed employee, Lamb was held responsible by the government. He was forced to sell his lands to cover the deficit but even the disposal of all his property was not adequate to meet it. Many influential friends came to his assistance, but he refused their offers, determined to cover the shortage as well as he could by himself. He resigned his office in 1797 and his remaining three years were particularly distressful. Constantly racked with pain, he continued to manage the affairs of his family and to deal with his monumental debt until he died in poverty on

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[92] Leake, *Memoir,* 223–24; Lossing, *Field-Book,* 1: 727–28; 2: 309–10.

[93] Lossing, *Empire State,* 351–52; Leake, *Memoir,* 333–36.

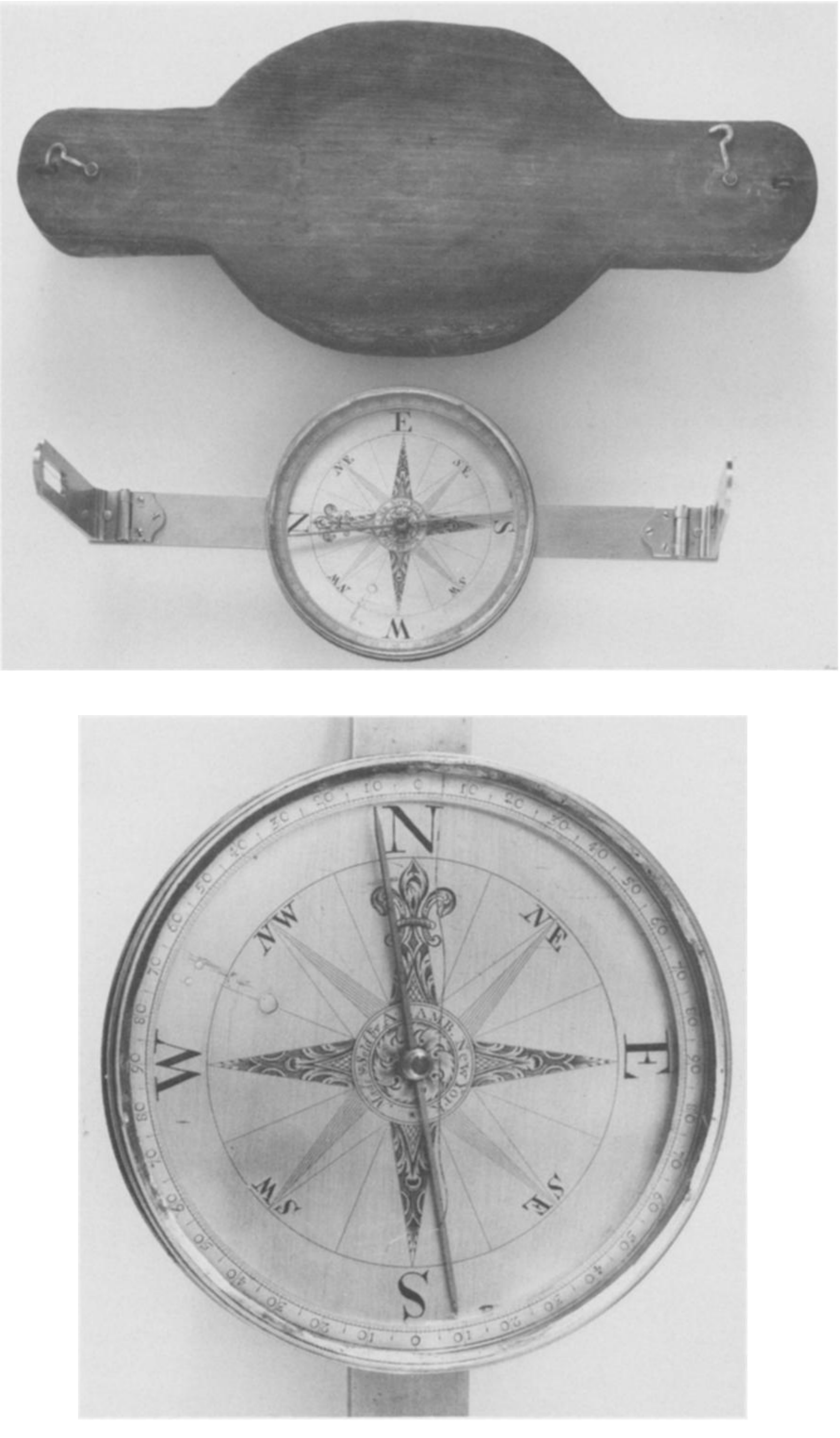

FIG. 35a. Plain surveying compass made by Lamb. Brass, with brass field cover and original field case of wood. b. Detail of compass dial of surveying compass, inscribed "Made & Sold by A. Lamb. New York." Courtesy the National Museum of American History, Smithsonian Institution.

31 May 1800. He received a splendid military funeral and was buried in the graveyard of the parish of Trinity Church.[94]

The Ogilvie Portrait

The last of Anthony Lamb's advertisements appeared in the New York press in 1775, shortly before the beginning of the American Revolution. Lamb was seventy-two years of age, but he continued to work as before and even to accept new challenges, as the production of the Ogilvie portrait was to prove. He advertised that he had engraved and was offering for sale:

> *To the PUBLIC*
>
> A Mezzotinto Print of the Revd Doctor OGILVIE (taken from an extraordinary likeness) is now at hand and will be finished in a few weeks;—the size of the plate is 15 inches by 11—As the Subscriber has it done solely at his own risque, and was the first person in this city, who proposed it, and was even promised the portrait which is now to be sent to England, to take a sketch from: He is in hopes that all those who are inclined to promote the arts and ingenuity in America, will make it a point to encourage the undertaking.
>
> ANTHONY LAMB.
>
> N.B. The price will not exceed half a dollar.[95]

The Reverend John Ogilvie was a notable figure in eighteenth century New York. A graduate of Yale College, he was ordained by the Bishop of London with a license to officiate in "the Plantations" and having an appointment to the Mohawk mission at Albany, Ogilvie returned to the colonies early in 1750 and assumed his responsibilities at St. Peter's Church.

Ogilvie's labors at Albany proved to be eminently successful, and in about 1756 he was appointed chaplain of the 62nd or Royal American Regiment of Foot. He accompanied Sir William Johnson on the expedition against Fort Niagara and fulfilled the assignment so competently that later he was commanded to accompany the army of occupation of Canada by General Amherst.

In 1764 Ogilvie was appointed assistant minister of the parish of Trinity Church in New York, where he achieved great popularity. He served there until his death on 26 November 1774 and was greatly mourned by his parishioners, particularly since he died at a time of considerable public excitement and concern over the prospect of war. In his will Ogilvie bequeathed large sums of money to charity and to King's College (now Columbia University).[96]

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[94] Lossing, *Field-Book,* 2: 585–86; Leake, *Memoir,* 348–57; Queen's College of the City University of New York, *Historical Documents Collection.* Last will and testament of John Lamb, 17 April 1800, No. 4476.

[95] *The New-York Journal, or the General Advertiser,* 26 January 1775.

[96] Malone, *Dictionary,* 7: 646–47, "Reverend John Ogilvie;" Morgan Dix, *A History of the Parish of Trinity Church in the City of New York* (New York: G. P. Putnam's Sons, 1898), Part II, 310–11.

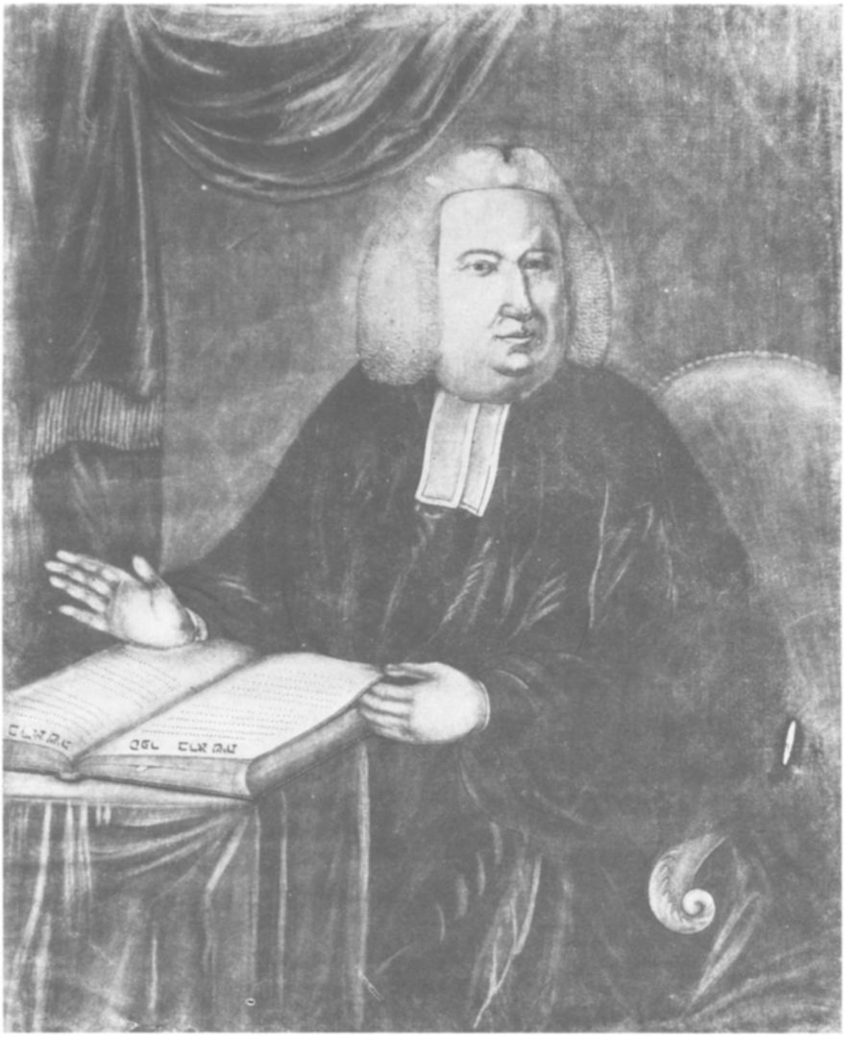

FIG. 36. Mezzotinto portrait of the Reverend John Ogilvie, 1775. Although unsigned, it is attributed to Anthony Lamb. Courtesy The New-York Historical Society.

Following Ogilvie's death there was a heated competition between Lamb and another unidentified engraver for approval to produce an engraving from the portrait of the lately deceased minister. The competitor had offered to send the portrait to England where an engraving to be made from it would be supervised by the well-known artist, Benjamin West, working in London. However, in advertising his mezzotinto in advance, Lamb succeeded in receiving the assignment.[97]

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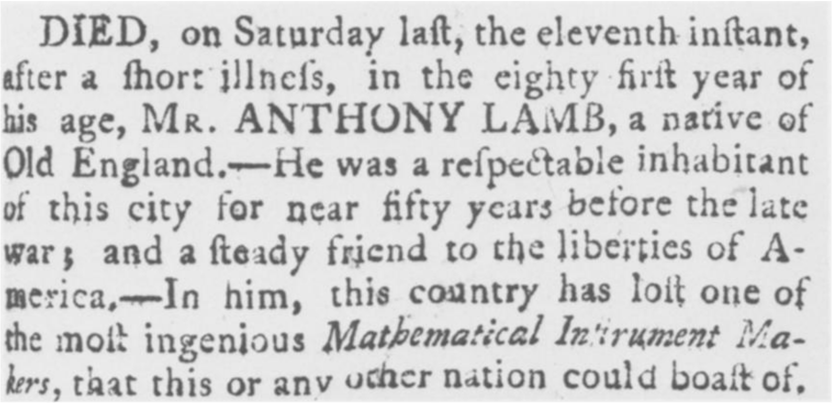
[97] The announcement of a competitor for the production of the Ogilvie portrait appeared in *The New-York Gazeteer,* 19 January 1775. Dix, *A History,* 359–62.



DIED, on Saturday laſt, the eleventh inſtant, after a ſhort illneſs, in the eighty firſt year of his age, MR. ANTHONY LAMB, a native of Old England.—He was a reſpectable inhabitant of this city for near fifty years before the late war; and a ſteady friend to the liberties of America.—In him, this country has loſt one of the moſt ingenious *Mathematical Inſtrument Makers*, that this or any other nation could boaſt of.

FIG. 37. Obituary notice of Anthony Lamb. From *Loudon's New-York Packet,* 13 December 1784.

The Twilight Years

At the outbreak of hostilities and the beginning of the American Revolution, the dominant sentiment in New York was loyalty to the British Crown. This was expressed particularly by the wealthy landed gentry and the merchant class, who found themselves defending their vested interests against the perils attending the cause of liberty, and the great financial loss which would result from the inevitable collapse of business as a consequence of war.

Anthony Lamb was seventy-three and although totally dedicated to the patriotic cause, his age prevented his participation in military service in the Continental Army. He may have continued to serve in the militia, and despite his years, he continued to work in his shop, producing instruments and related items required by the military.

Disaster followed close on the heels of the British army of occupation when it arrived on 15 September 1776, however. Four days later a great fire swept through the region between Whitehall and Broad Streets and raged as far north as Beaver Street and burning down to the river's edge, leaving a path of devastation in its wake three quarters of a mile in length. Lamb's shop on Hunter's Key did not escape the fire, and he was forced to flee the city.[98]

Two years later another fire on the waterfront consumed nearly all of the block south of Pearl Street between Coentis and Old Slips, and the ruins remained abandoned for the seven years of the British occupation.

Lamb made his way out of the city to New Haven, Connecticut where he worked for three years. Then in July 1779, during Lord Tryon's second incursion into Connecticut, Lamb was again forced to flee before the British forces. At this time he probably moved to nearby Southington where his son had transferred his family at the outbreak of hostilities. No evidence of his presence in New Haven or Southington exists in the public records, but it seems likely that he had moved in with his daughter-in-law.

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[98] Thomas A. Janvier, *In Old New York* (New York: Harper and Brothers, 1894), 27–56.

Lamb returned to New York following the British evacuation on 25 November 1783. He found the city in a miserable state, with wharves crumbled from neglect, and private and public buildings which had been occupied by the British fallen into ruin. New streets opened before the war had not been maintained and were reduced to idle wastes. The population of the city had dwindled to half of what it had been, and the civil government was practically non-existent. At the age of eighty Lamb was unable to undertake the restoration of a shop, although the city rebuilt rapidly, and new buildings were erected on the sites destroyed by the fires. He lived in retirement for the short time left to him.[99]

Of the countless number of instruments and other items which Lamb had produced during his working career of more than half a century, only eight have survived. Finely executed in the best tradition of his craft, they constitute modest monuments to the service he provided to the mathematical practitioners of his time.

Exemplifying more the traditional English maker of mathematical instruments than those who worked in the American colonies, Lamb not only pursued a specialized craft serving a wide community of the mathematical practitioners on sea and on land as well as local needs but also fulfilled the responsibilities of a citizen, active with civic duties, and making important contributions to both. The indiscretions of his youth were acknowledged but never shadowed his career, and he emerged as one of the most respected men in New York in his time.

Euloge

Lamb lived to see the end of the conflict and the success of the American Revolution which he had so avidly supported. Ill for only a brief time, he died on 11 December 1784 at eighty-one years of age. His obituary notice appeared two days later in *Loudon's New-York Packet:*

> DIED, on Saturday last, the eleventh instant, after a short illness in the eighty first year of his age, ANTHONY LAMB, a native of England.—He was a respectable inhabitant of his city for near fifty years before the late war; and a steady friend to the liberties of America.—In him, this country has lost one of the most ingenious *Mathematical Instrument Makers,* that this or any other nation could boast of. Though advanced in age, he retained his faculties to the last, was always remarkably chearful and facetious.—He was an affectionate husband, tender parent, steady friend, obliging neighbor, and was distinguished for his philanthropy. He resigned his spirit to God, who gave it, in a good old age, leaving behind him many friends, and we may with confidence say, *no enemies.*—But, to say more would be words spent in vain, His *Standing Monument* is A GOOD NAME.[100]

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[99] Leake, *Memoir,* 298–99.

[100] *Loudon's New-York Packet,* 13 December 1784, p. 3, col. 1; Leake, *Memoir,* 298–99.

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